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PRIMARY ARITHMETIC

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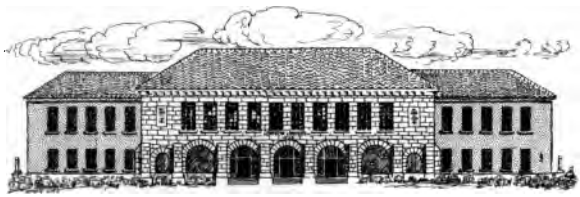

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PHILIPPINE EDUCATION SERIES

PRIMARY ARITHMETIC

BY

MABEL BONSALL, A.B.
(INDIANA UNIVERSITY)
FORMERLY TEACHER OF MATHEMATICS IN THE PHILIPPINE NORMAL SCHOOL, MANILA

ILLUSTRATED

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PREFACE

THIS Primary Arithmetic is designed for use in the primary schools of the Philippine Islands. It is the outgrowth of two years' experience by the author in the attempt to teach Filipinos the essentials of arithmetic. All teachers in the department, both Filipino and American, have long felt the need of a well-graded first book in arithmetic, written in simple language, and making use of material familiar to the Filipino pupil which will hold his interest and make intelligible to him the rudiments of arithmetic.

The grading of the book has received special attention. The language is believed to be simple enough to be read by pupils in the primary schools. Part I has a vocabulary of less than one hundred and ninety words, chosen from the primers in use in the Islands. Care has been taken not to introduce a number vocabulary in advance of the child's language and knowledge. A judicious combination of the spiral and topical methods has not only made the grading progressive and easy, but has made possible a presentation of essentials which the pupil can readily comprehend.

The child's interest is secured by means of many illustrations and by certain sequences of interest which run through the lessons. The problems deal with facts familiar to the pupils and connect the school work with the real life about them. As far as possible the problems are of an industrial and commercial nature.

Each part is intended to cover the work of one school year.

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If it is desired that the number work be oral in the first year, Part I, which treats of numbers from 1 to 10, may be used as a brief review at the beginning of the second year.

Part II treats of numbers to 100 and introduces simple units of measurement.

Part III completes the primary school study of the fundamental operations and introduces easy exercises in fractions. A feature of this part is the introduction of a series of business pages, treating of important Philippine industries. The number and variety of the problems will enable the pupil who has done the work thoroughly to carry on all the business operations of ordinary Philippine life.

The author wishes to make grateful acknowledgment to the following persons who read the manuscript and made valuable suggestions: John H. Walsh, Associate Superintendent of Schools, New York City, and author of a series of arithmetics; Dr. Richard G. Boone, editor of *Education*, Boston; Alexander B. Coffey, Professor of Education, College of William and Mary, Virginia; Dr. F. D. Strayer, Teachers College, Columbia University; Miss Laura Frazee, Primary Supervisor, Indianapolis; Miss Belle Caffee, Critic Teacher, Indiana State Normal School; William Hazen Eastman, Teacher in Rizal Province, P. I.; O. S. Reimold, formerly Division Superintendent of Tarlac Province, P. I.; G. N. Tremper, formerly Teacher in Cebu Province, P. I.; Miss Philinda P. Rand, Teacher in Lingayen High School, P. I.; and J. M. Kniseley, formerly Division Superintendent of Ilocos Norte Province, P. I.

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SUGGESTIONS TO TEACHERS

I. There are three parts to every lesson in arithmetic: the assignment, the preparation, and the recitation. For all three the teacher is largely responsible.

1. The Assignment. — Have clearly in mind what the lesson is to be. Tell your pupils in as few words as possible what you expect them to do. Keep in mind the length of time you expect the pupils to spend in preparing the lesson; give enough work to fill that time, and let the class understand that you expect *all* of the lesson to be written in *good form*. When a new subject is assigned, take five or ten minutes to show the pupils how to begin their preparation. Read carefully all the notes on a page before assigning the lesson on that page.

2. The Preparation.

(*a*) *By the teacher.* — The work given in this book is but a small part of the number work which the pupils are expected to do during the first three years of their school life. The oral work which every good teacher prepares and presents to her class is by far the most important part. Have your supplementary work prepared, and know exactly what you are going to do when you go before your class.

The success of the recitation depends largely on the teacher's preparation. If you neglect your work, the pupils will neglect theirs.

(*b*) *By the class.* — Do not ask your pupils to recite on the lessons in the book without giving them time for preparation. Young pupils study best when a certain period each day is given to the preparation of a certain lesson. If the lesson has been clearly assigned, the pupils should be expected to prepare it without help from the teacher or from each other.

Above all, insist that each pupil be honest and independent in his preparation of every lesson, and that the papers he brings to class be neatly written and the result of his own best efforts.

3. The Recitation. — Do not begin the recitation until you have the undivided attention of every member of your class. It is often

helpful to give at the beginning of a recitation a short, rapid, oral review of the preceding lesson.

Always state your question before you name the pupil who is to answer it. This makes it necessary for the whole class to think about the question and its answer.

The pupils should not write any work which can be done orally, or read from papers or slates the answers to the questions marked "oral" in the text.

Be sure that the pupils understand the language of a problem before expecting them to get the number ideas.

If the pupils do not seem to have mastered a principle when the problems involving it have all been solved, give other examples and problems, both oral and written, of a similar kind, taking care to keep the language simple and the conditions clearly stated. Make your problems about the things in which the pupils are interested.

If the pupils answer in concert, the slow ones will depend on those who think quickly. It is usually better to have one pupil at a time stand to recite. In rapid drill work, such as that given with the circles on page 57, it might be well to have the class stand and the pupils recite singly, as suggested in the foot-notes.

The drills should not be neglected. Make them short, rapid, and frequent. Keep a circle on the board most of the time, changing the numbers around and within it every day and using it for drill in all the processes. A few minutes a day outside of the regular recitation period might be given to this.

II. For the work in Part I the teacher must have on her table during the recitation a collection of small objects such as pebbles, nuts, seeds, blocks, etc., also a box of two or three hundred sticks of uniform size, an inch or more in length, for use in illustrating number combinations as suggested in the lessons and foot-notes. Any familiar objects in the schoolroom or outside may be used by both teacher and pupils in supplementary oral work.

The pictures are expected to help the pupils in solving the problems given and in making others.

Counting exercises, which are frequently suggested, afford drill in pronunciation.

PRIMARY ARITHMETIC

PART I

One Two

One Two

One Two

1 2

1 2

1 2

One and one are . . . .

1 and 1 are . . . .

Before beginning each lesson, teach the names and the printed words for objects in the lesson which the pupils do not know. Have the pupils use orally, "I see one cup," etc. Use "I see" with objects in the room. Count five, using objects which they can handle, such as books, pencils, sticks, pebbles, etc. Do not allow the pupils to give the answer "two" when it should be "two cups" or "two leaves."

One and one are . . . .

1 and 1 are . . . .

1 and 1 are . . . .

Three 3

I see 3

I see . . .

Two and one are . . . .

Two eggs and one egg are three eggs.

2 and 1 are . . . .

2 and 1 are . . . .

1 and 2 are . . . .

One and two are . . . .

1 tree and 2 trees are 3 trees.

1 and 2 are . . . .

One and . . . are two

1 fan and . . . are 2 fans.

1 and . . . are 2.

2 and . . . are 3

Two cups and . . . are three cups.

and . . . are

2 and . . . are 3.

1 and . . . are 3

1 hat and . . . are 3 hats.

1 and . . . are 3.

I have three mangos.

I give Paz one mango.

Now I have . . . mangos.

One and one and one are . . . .

1 and 1 and 1 are . . . .

Have the pupils place sticks to illustrate the combinations learned. Fill the blank in the first line with "one fan." Let pupils use "I have" and "You have" with objects they are handling.

I see four birds.

Count four boys. Give me 4 sticks.

A dog has 4 feet.

Three jars and one jar are . . . .

3 sticks and 1 stick are . . . .

3 cups and 1 cup are . . . .

3 and 1 are . . . .

One / and three /// are . . . .

1 egg and 3 eggs are . . . .

. . . I and . . . III are . . . .

1 and 3 are . . . .

Ask the pupils to find groups of 2, 3, and 4 objects, and make problems about them. Let pupils count 10 objects.

2 and 2 are . . . .

2 mangos and 2 mangos are . . . .

. . . and . . . are . . . .

2 and 2 are . . . .

There are . . . twos in four.

A bird has . . . feet.

Two birds have . . . feet

A bird has . . . eyes.

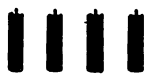
Two birds have . . . eyes.

1 and 1 and 1 and 1 are . . . .

There are . . . ones in four.

1 and . . . are 4

1 bird and . . . are 4 birds.

. . . and . . . are 

3 eggs and . . . are 4 eggs.

1 and . . . are 4. 3 and . . . are 4.

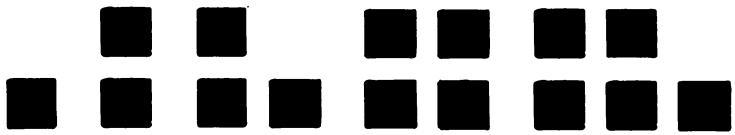
The teacher should give many other oral problems about objects familiar to the pupils. Pupils continue counting, and the use of "I see," "I have," and "You have," in connection with objects.

2 // and . . . are 4 ////

2 eyes and . . . are 4 eyes.

2 and . . . are 4.

I have 4 books. I give Juan 2 books.
Now I have . . . books.



1 and 1 are . . . .

2 and . . . are 3.

3 and 1 are . . . .

1 and 2 are . . . .

2 and . . . are 4.

1 and . . . are 3.

3 and . . . are 4.

1 and . . . are 3.

2 and 2 are . . . .

There are . . . twos in four.

Pupils draw simple objects, such as leaves, fans, sticks, etc., to illustrate the abstract examples on this page.

1	2	3	4	5
one	two	three	four	five

Here are five bells.

There are 5 fingers on one hand.

I see . . . balls.

and are . . . .

4 bells and 1 bell are . . . .

4 and 1 are . . . .

and are . . . .

1 dog and 4 dogs are . . . .

1 and 4 are . . . .

3 and 2 are . . . .

3 mangos and 2 mangos are . . . .

3 and 2 are . . . .

Pupils count fifteen. Drill on correct pronunciation of number names.

4 boys and . . . are 5 boys.

4 centavos and . . . are 5 centavos.

1 cup and . . . cups are 5 cups.

4 and . . . are 5. 1 and . . . are 5.

2 // and . . . are 5 /////

2 chicos and . . . are 5 chicos.

3 bells and . . . are 5 bells.

3 and . . . are 5. 2 and . . . are 5.

Here are 5 chicos.

If Leon eats 4 chicos, how many chicos are left?

There are . . . chicos left.

Juan has 5 pencils. He gives José 3 pencils. Juan now has . . . pencils.

Notice that each design at the top of the page is made of 5 sticks. Give each pupil a handful of sticks. Let the pupils lay the sticks in the designs given, and make new designs, using 5 sticks for each.

I see . . . birds.

There is a nest in the tree.

How many eggs do you see?

I see . . . eggs.

A bird has . . . feet.

2 birds have . . . feet.

If one bird flies away, how many birds are left?

4 birds and . . . are 5 birds.

2 eggs and . . . are 5 eggs.

How many eyes have 2 birds?

Juan has 3 centavos. Leon gives him 1 centavo. Juan now has . . . centavos.

2 . . . and 3 . . . are . . . .

1 . . . and 4 . . . are . . . .

2 . . . and 2 . . . are . . . .

Pupils copy the last three lines, supplying the names of objects.

I see six pots and six candles.

Take 6 steps. Draw 6 squares.

Hold up 6 fingers. Count six.

Draw 5 lines. Draw 1 line. How many lines do you see?

5 fans and 1 fan are . . . .

1 pot and 5 pots are . . . .

5 and 1 are . . . . 1 and 5 are . . . .

4 leaves and 2 leaves are . . . .

4 bells and 2 bells are . . . .

2 candles and 4 candles are . . . .

2 birds and 4 birds are . . . .

4 and 2 are . . . . 2 and 4 are . . . .

I see 2 plates. On each plate there are . . . chicos. On the two plates there are . . . chicos.

3 plates and 3 plates are . . . .

There are . . . threes in six.

2 times 3 are . . . .

2 birds and 2 birds and 2 birds are . . . .

A boy has . . . eyes. 2 boys have . . . eyes.

There are . . . twos in six.

Three times 2 are . . . .

Leon had 6 bananas. He ate 1 banana and had . . . bananas left.

I have 6 chicos in a basket. If I put 2 of them on a plate, how many chicos are left in the basket?

Take 6 sticks in your right hand. Lay 3 of them on your desk. How many sticks are now in your hand?

Pupils find groups of 5 and 6 objects, and make problems about them.

4 leaves and . . . are 6 leaves.

4 hats and . . . are 6 hats.

5 candles and . . . are 6 candles.

5 and . . . are 6. 2 and . . . are 6.

1 and . . . are 6. 4 and . . . are 6.

3 and . . . are 6. 2 and . . . are 6.

\+ and = are

2+1=	4+2=	3+·=4
3+3=	1+3=	2+·=5
5+1=	3+2=	4+·=6
2+3=	2+2=	2+·=4
2 times 1=		1+·=3
2 times 2=		5+·=6
2 times 3=		3+·=6

There are . . . twos in six.

Pupils lay with sticks the designs given above, and make new ones, using 6 sticks for each. Count 20. Explain the signs + and =.

1 frog and 6 frogs are . . . .
6 eggs and 1 egg are . . . .
There are 7 days in a week.
There are 5 school days in 1 week.
5 days and 2 days are . . . .

Here are 5 green squares and 2 black squares. Here are . . . squares.

I have 2 bananas. Luz gives me 5 bananas. Now I have . . . bananas.

4 birds and 3 birds are . . . .
3 trees and 4 trees are . . . .

6+1=	5+1=	3+3=
3+2=	2+5=	5+2=
4+3=	1+3=	3+4=

I have 7 shells. If I give you 1 shell, I will have . . . shells.

6 candles and . . . are 7 candles.

and . . . are

5 frogs and . . . are 7 frogs.

In 1 week there are . . . days.

How many school days are in 1 week?

Paz has 7 candles. She burns 3 candles. Paz now has . . . candles.

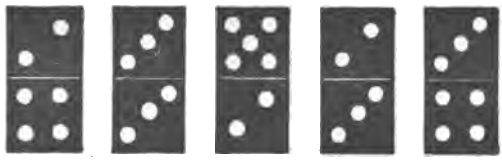
3 weeks and . . . are 7 weeks.

4 days and . . . are 7 days.

I see . . . eggs in a basket.

If I take out 3 eggs, there will be . . . eggs left in the basket.

6+·=7	4+·=7	5+·=7
2+·=7	1+·=7	3+·=7



3+1=	3+3=	3+ ·=7
2+ ·=6	2+ ·=4	1+ ·=4
5+ ·=7	6+ ·=7	3+ ·=6
4+3=	1+4=	2+ ·=3

There are . . . twos in four.

There are . . . twos in six.

There are . . . threes in six.

I have 3 pencils in each hand. How many pencils have I?

I see 3 nests. In each nest there are 2 eggs. How many eggs do I see?

I see 5 red fans and 2 black fans. I see . . . fans.

4 hats and 3 hats are how many hats?

Pupils tell how many dots are in each block at top of page.

1	one	I
2	two	II
3	three	III
4	four	IIII
5	five	𝍸
6	six	𝍸 I
7	seven	𝍸 II
8	eight	𝍸 III
9	nine	𝍸 IIII
10	ten	𝍸 𝍸

boxes.

shells.

pins.

Bring to school 8 leaves, 9 paper squares, 10 paper circles.

Take 8 steps. Hold up 10 fingers.

7 bees and 1 bee are . . . .
7 balls and 1 ball are . . . .
1 boy and 7 boys are . . . .

7+1= 1+7=

8 birds and 1 bird are . . . .
8 jars and 1 jar are . . . .
1 basket and 8 baskets are . . . .

8+1= 1+8=

9 trees and 1 tree are . . . .
9 pots and 1 pot are . . . .
1 girl and 9 girls are . . . .

9+1= 1+9=

eight	nine	ten
8	9	10

7 mangos and . . . are 8 mangos.

1 shell and . . . are 8 shells.

$7+\cdot=8$ $1+\cdot=8$

8 frogs and . . . are 9 frogs.

1 tree and . . . are 9 trees.

$8+\cdot=9$ $1+\cdot=9$

9 pins and . . . are 10 pins.

1 dog and . . . are 10 dogs.

$9+\cdot=10$ $1+\cdot=10$

. . . pens and . . . pens are . . . .

2 bees and 6 bees are . . . .

$6+2=$ $2+6=$

. . . shells and . . . shells are . . . .

2 plates and 7 plates are . . . .

$7+2=$ $2+7=$

Give many oral problems and examples in every lesson.

8 cats and 2 cats are . . . .

2 buttons and 8 buttons are . . . .

2 boxes and 8 boxes are . . . .

$8+2=$ $2+8=$

How many horses are 7 horses and 2 horses?

Luz has 8 flowers. She gives Maria 6 flowers. Luz has . . . flowers left.

2 bananas and . . . are 8 bananas.

$6+\cdot=8$ $2+\cdot=8$

There are 9 birds in a tree. Two fly away. How many birds are left in the tree?

2 chicos and . . . are 9 chicos.

$7+\cdot=9$ $2+\cdot=9$

Let the pupils make problems about the cats, flowers, and birds.

Draw 10 circles. Cross out 2 circles. How many circles are left?

8 pens and . . . are 10 pens.

2 cats and . . . are 10 cats.

$8+\cdot=10$ $2+\cdot=10$

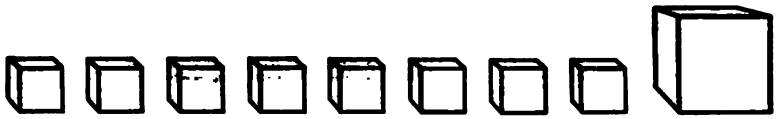
I have 10 beans. If I plant 8 beans, I will have . . . beans left.

José has 6 small bananas and 2 large bananas. He has . . . bananas.

Add:

1	1	1	1	1	2	2	2	2
5	6	7	8	9	5	6	7	8
6								

2	4	3	2	1	5	2	1	2
3	2	3	2	3	2	4	4	5



Here are 8 small boxes and 1 large box.

Each small box holds 1 chupa.

The large box holds 1 ganta.

There are 8 chupas in 1 ganta.

I have 1 ganta of rice. I pour it into the large box. It fills the large box.

I pour the rice from the large box into the small boxes. It fills the small boxes.

1 ganta of rice is . . . chupas of rice.

This pot holds 4 chupas.

This cup holds 2 chupas.

How many times can I fill the pot from 1 ganta of rice?

How many times can I fill the cup from 1 ganta of rice?

Have chupa and ganta measures for the pupils to fill with sand, water, etc. Give other problems, using these measures.

4 chupas and 4 chupas are . . . .

There are . . . fours in eight.

2 times 4 are . . . .

2+2+2+2=

There are . . . twos in eight.

4 times 2 are . . . .

If 1 paper costs 4 centavos, 2 papers will cost . . . centavos.

If 1 chupa of milk costs 2 centavos, 4 chupas will cost . . . centavos.

How many hands have 4 boys?

How many feet have 2 dogs?

How many eyes have 4 horses?

Count by 2's (twos) from 2 to 8.

Count by 2's from 1 to 9.

I see a cart.

The cart has . . . wheels.

Two carts have . . . wheels.

Four carts have . . . wheels.

4 times 2 wheels are . . . .

There are . . . jars on the cart, and the man has . . . more jars.

6 jars and 2 jars are .

Each jar holds 3 gantas. 2 jars hold . . . gantas.

A carabao has . . . feet and . . . horns.

2 carabaos have . . . feet.

4 carabaos have . . . horns.

Give other problems about the picture.

A lemon has two halves.

A square has two halves.

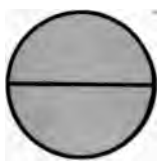
One half of the square is white.

One half of the square is yellow.

This is $\frac{1}{2}$ of a circle.

Show me $\frac{1}{2}$ of your pencil.

Fold your handkerchief to show $\frac{1}{2}$ of it.



A circle has $\frac{2}{2}$.

$$\frac{1}{2}+\frac{1}{2}=\frac{2}{2}$$

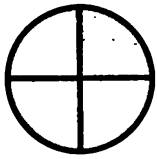
This basket holds $\frac{1}{2}$ of one ganta. How many baskets like this will hold one ganta?

In 1 papaya there are . . . halves.

In 1 there are how many halves?

$$\frac{1}{2}+\frac{1}{2}=1 \qquad \frac{2}{2}=1$$

At the beginning of this lesson cut an orange, papaya, or lemon, into halves, taking care that they shall be exactly equal. Have the pupils cut squares and circles of paper into halves.



In one circle there are four fourths.

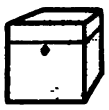
This is $\frac{1}{4}$ of a circle.

In a line there are $\frac{4}{4}$. $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

Fold your handkerchief to show $\frac{1}{4}$ of it.

In one lemon there are . . . fourths.

$\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}=\frac{4}{4}$ $\frac{4}{4}=1$



This box holds $\frac{1}{4}$ of 1 ganta.

How many boxes like this will hold 1 ganta?

Draw a line as long as your pencil.

Draw a line $\frac{1}{2}$ as long as your pencil.

Draw a line $\frac{1}{4}$ as long as your pencil.

Cover $\frac{1}{2}$ of your slate with your book.

Cover $\frac{1}{4}$ of this page with paper.

Draw a square and divide it into fourths.

Have the pupils show fourths by folding and cutting squares, circles, etc. See note on page 32.

One half of two flowers is one flower.

$\frac{1}{2}$ of 2 books is . . . . $\frac{1}{2}$ of 2 is . . . .

I see 2 birds sitting and 2 birds flying.

2 times 2 birds are . . . .

$\frac{1}{2}$ of 4 birds is . . . .

2 times 2 are . . . . $\frac{1}{2}$ of 4 is . . . .

Here are . . . white pigs and . . . black pigs. 2 times 3 pigs are . . . .

$\frac{1}{2}$ of 6 pigs is . . . . $\frac{1}{2}$ of 6 is . . . .

Juana has 6 pens. She gives me $\frac{1}{2}$ of the pens. Juana now has . . . pens.

$\frac{1}{2}$ of 8 stars is how many stars?

Take 4 books in each hand.

$\frac{1}{2}$ of 8 books is . . . . $\frac{1}{2}$ of 8 is . . . .

I see . . . spoons. $5+5=$

How many fingers have you on one hand? $\frac{1}{2}$ of 10 fingers is . . . .

There are . . . 5's in ten. $\frac{1}{2}$ of 10 is . . . .

There are 10 eggs in a nest. I take out $\frac{1}{2}$ of the eggs. How many do I take out?

There are . . . ones in four.

$\frac{1}{4}$ of 4 centavos is . . . .

4 times 1 are . . . . $\frac{1}{4}$ of 4 is . . . .

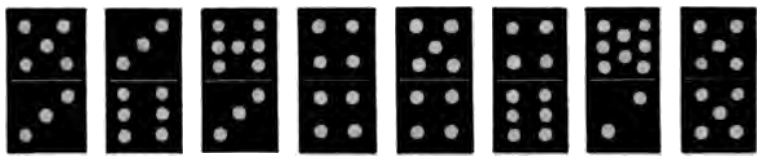
I see 4 boys. Each boy has 2 centavos. All the boys have . . . centavos.

4 times 2 are . . . . $\frac{1}{4}$ of 8 is . . . .

In 1 ganta there are . . . chupas.

In $\frac{1}{4}$ of 1 ganta there are . . . chupas.

Give many other problems, using $\frac{1}{2}$ of 2, 4, 6, 8, and 10; $\frac{1}{4}$ of 4 and 8.



I have 5 small flags and 3 large flags. I have . . . flags.

In one week there are . . . days. In 1 week and 3 days there are . . . days.

6 pesos and 3 pesos are . . . .

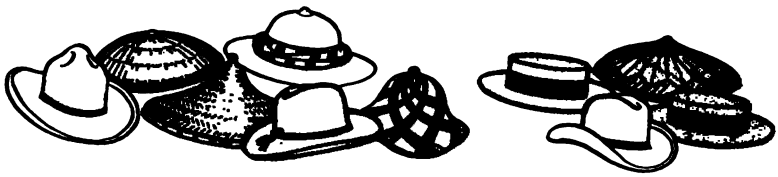
Luz has 5 centavos. I give her 4 centavos. She now has . . . centavos.

Draw 6 small circles and 3 large circles. How many circles have you drawn ?

Luis has 6 black goats and 4 yellow goats. How many goats has he ?

Pedro has 7 oranges. I give him 3 oranges. He now has . . . oranges.

Have pupils give the number of dots in each block at top of the page.



There are . . . hats in this picture.

6 hats and . . . are 10 hats.

There are 10 girls in a class. Three girls go home. How many girls are left in the class?

I have 8 rats in a trap. Three rats get out. How many rats are left in the trap?

There are 9 plates on a table. Maria takes 6 of them away. How many plates are left on the table?

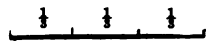
Subtract:

8	6	9	7	5	10	9	7	6
7	2	3	4	2	4	4	2	3
1	4							

In subtracting the pupil should say "7 and 1 are 8," "2 and 4 are 6," etc.

In a circle there are three thirds.

$\frac{1}{3}+\frac{1}{3}+\frac{1}{3}=\frac{3}{3}$.

A line has . . . thirds. 

A chico has $\frac{3}{3}$.

This cake has . . . thirds. If I eat $\frac{1}{3}$ of the cake, how many thirds are left?

What part of this square is blue?

There are . . . ones in three.
3 times . . . are 3. $\frac{1}{3}$ of 3 is . . . .
Count by 2's to 6.
3 times . . . are 6. $\frac{1}{3}$ of 6 is . . . .
Count by 3's to 9.
3 times . . . are 9. $\frac{1}{3}$ of 9 is . . . .

Let the pupils fold and cut strings, strips of paper, etc., into thirds.

I see in the picture . . . hen, . . . white chickens, and . . . black chickens. Seven chickens and 3 chickens are . . . .

4 times 2 hens are . . . .

Paz has 3 baskets. In each basket there are 3 mangos. How many mangos has Paz?

Juan has 4 candles. He burns 3 candles. How many candles has he left?

There are . . . spoons on the plate and . . . . spoons in the glass. How many spoons do you see?

If I take 2 spoons from the plate and put them into the glass, there will be . . . on the plate and . . . in the glass.

4+2=	5+4=	2+·=10
½ of 6=	4+6=	7+·= 9
7+3=	⅓ of 9=	3+·= 6
3+2=	3+6=	6+·= 8

Add:

3	4	3	6	2	3	1	4	6
5	3	3	2	5	6	9	5	4

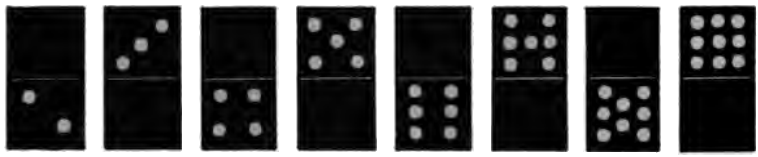
Subtract:

7	8	9	8	10	10	5	6	9
2	4	6	7	3	4	4	3	1

½ of 8= ⅓ of 6= ¼ of 4= ¼ of 8=

2 times 2 are .... 2 times 4 are ....

2 times 3 are .... 2 times 5 are ....



Have the pupils draw the blocks, and place in the blank half of each enough dots to make 10.

PART II

NUMBERS TO 100

Reading and writing numbers; dozen; inch, foot, and yard; metric measures; addition; subtraction; multiplication; division.

NUMBERS TO 20

1. Oral.

1 2 3 4 5 6 7 8 9 10

11 eleven 10+ 1=11

12 twelve 10+ 2=12

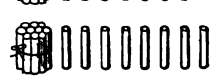
13 thirteen 10+ 3=13

14 fourteen 10+ 4=14

15 fifteen 10+ 5=15

16 sixteen 10+ 6=16

17 seventeen 10+ 7=17

18 eighteen  10+ 8=18

19 nineteen 10+ 9=19

20 twenty 10+10=20

2. Oral.

1. Read the following numbers:

12, 14, 17, 15, 13, 10, 18, 11, 9, 16, 20, 19.

2. Count to 20 by 1's, 2's, 4's, and 5's.

3. Take 20 steps. Tap 20 times.

4. ·+1= 9	·+1=13	·+1=17
5. ·+1=10	·+1=14	·+1=18
6. ·+1=11	·+1=15	·+1=19
7. ·+1=12	·+1=16	·+1=20

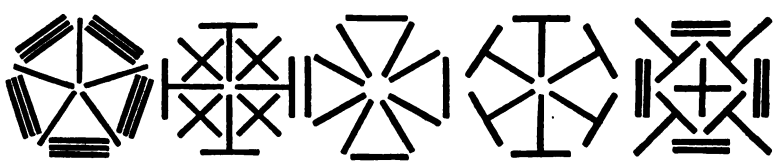
8. Count by 2's from 1 to 19. 1, 3, 5, 7, etc.

9. Count by 3's from 1 to 19. 1, 4, 7, etc.

10. Write the numbers from 10 to 20.

11. 10+·=11	10+·=16
12. 10+·=12	10+·=17
13. 10+·=13	10+·=18
14. 10+·=14	10+·=19
15. 10+·=15	10+·=20

16. How many sticks are used in each picture?



Drill on the pronunciation, spelling, reading, and writing of numbers from 1 to 20. Have the pupils count 12 girls, 16 books, 19 words, etc., and lay designs with the sticks, each containing 12, 13, 14, etc. Count 50.

3. Oral.

1. How many chicos do you see?

2. Pedro has come with his basket to get the chicos. He takes 1 chico from the tree and puts it in his basket. How many chicos are left on the tree?

3. When he has 2 chicos in the basket there will be . . . chicos on the tree.

4. 5 baskets and 6 baskets are . . . baskets.

5. Take 7 sticks in your right hand and 4 sticks in your left hand. How many sticks have you in both hands?

6.	$10+1=$	$7+\cdot=11$	$3+\cdot=11$	$\frac{1}{2}$ of $6=$
7.	$8+1=$	$2+9=$	$2+\cdot=11$	$\frac{1}{3}$ of $6=$
8.	$9+\cdot=11$	$8+\cdot=11$	$1+\cdot=11$	$\frac{1}{2}$ of $8=$
9.	$5+6=$	$4+7=$	$7+2=$	$\frac{1}{3}$ of $9=$
10.	$\frac{1}{2}$ of $4=$	$5+\cdot=11$	$7+4=$	$\frac{1}{2}$ of $10=$
11.	$\frac{1}{3}$ of $3=$	$8+3=$	$10+\cdot=11$	$\frac{1}{4}$ of $8=$

Make other problems about the picture.

4. Oral.

1. How many mice are in the picture?

2. 9 mice and . . . mice are 12 mice.

3. If two mice run away, how many are left?

4. In one class there are 5 girls and 7 boys. How many pupils are in the class?

5. Luis bought 12 bananas at the market. He gave 3 to Leon and 3 to Carmen. How many did he give away? How many were left?

6. There are 8 gantas of rice in the large basket, and 4 gantas in the small basket. How many gantas of rice are in both baskets?

Add:

7. 2	8. 7	9. 3	10. 4	11. 6	12. 5	13. 2
8	5	9	8	6	6	10
14. 4	15. 5	16. 5	17. 2	18. 4	19. 3	20. 9
6	3	5	7	4	7	3

Let the pupils make problems about the mice.

5. Oral.

1. Here are . . . pins.
2. Twelve pins are one dozen pins.
3. Draw one dozen circles on your paper.
4. How many mice make a dozen?
5. How many pins are in a half dozen?
6. Take half a dozen steps.

7. I see . . . plates. On each plate are . . . mangos. On all the plates there are . . . mangos.
8. 3 times 4 mangos are . . . $\frac{1}{3}$ of 12 mangos is . . .
9. $\frac{1}{3}$ of 12 is . . . There are . . . 4's in 12.

10. How many plates are in these 4 piles?
11. There are . . . 3's in 12.
12. One fourth of 12 plates is . . .
13. 4 times 3 are . . . $\frac{1}{4}$ of 12 is . . .

Let the pupils show $\frac{1}{2}$ of 12, $\frac{1}{3}$ of 12, and $\frac{1}{4}$ of 12 with sticks.

INCH, FOOT, YARD

6. Oral.

1. Here are two lines. The first line is 1 inch long. The second line is . . . inches long.

2. Cut a stick 1 inch long, another 6 inches long, and another 12 inches long.

3. There are 12 inches in 1 foot.

4. Show me your stick which is 1 foot long.

5. Show me your stick which is $\frac{1}{2}$ of a foot long.

6. How many inches long is your book? How many inches wide is it?

7. Measure the top of the table with your foot stick. How many feet long and wide is it?

8. How wide is your desk?

9. How high is the table?

10. How long is your arm?

11. How many feet can you jump?

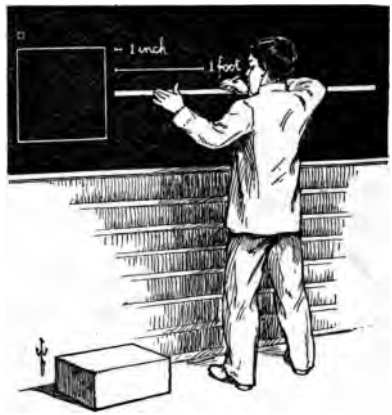
12. Measure one edge of your handkerchief.

13. There are . . . inches in $\frac{1}{2}$ of a foot.

14. There are . . . inches in $\frac{1}{3}$ of a foot.

Have the pupils measure many familiar objects at home and at school. Teach them to express measurements in feet and inches.

7. Oral.



1. This boy is drawing a line 3 feet long on the blackboard. The line will be 1 yard long. There are 3 feet in 1 yard.

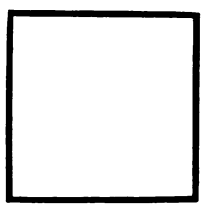
2. Bring to school a string 1 yard long. Measure your string with your foot stick.

3. How many yards long is your house?

4. How many feet are there in 2 yards?

5. How many feet long is a 3-yard mat?

6. This square is 1 inch on each side. It is called a square inch. How many inches around it?



7. Draw a square 1 foot on each side. It is called a square foot.

8. Draw a square yard. How many feet long is one side? How many yards around it? How many feet around it?

12 inches = 1 foot.

3 feet = 1 yard.

Have square inches cut of paper, square feet and square yards drawn on the blackboard and floor.

8. Oral.

1. Count the stripes in the flag.

2. How many red stripes are there in the flag? How many white stripes?

3. 7 stripes and 6 stripes are . . .

4. I have 4 large flags and 7 small flags. I have . . . flags.

5. At 6 centavos each, what will 2 small flags cost?

6. I have 13 centavos. If I pay 10 centavos for a cake, how many centavos will be left?

7. How many days are there in 1 week and 5 days?

8. In 1 foot and 1 inch there are . . . inches.

9. Manuel has 13 chicos. If he gives away a dozen chicos, he will have . . . left.

10. Count by 2's from 1 to 13.

11. Count by 3's from 1 to 13.

12.	$10+3=$	$5+8=$	$5+\cdot=13$
13.	$7+6=$	$6+\cdot=13$	$4+\cdot=13$
14.	$4+\cdot=13$	$3+\cdot=13$	$6+6=$
15.	$2+11=$	$12+\cdot=13$	$9+4=$
16.	$7+\cdot=13$	$9+3=$	$10+\cdot=13$

9. Oral.

1. Count the ants in the picture.

2. How many times can you count 7 ants?

3. 2 times 7 are . . . $\frac{1}{2}$ of 14 is . . .

4. Esteban is 14 years old and his sister is 2 years younger. How old is his sister?

5. How many days are there in two weeks?

6. There are 8 boys and 6 girls in one row. How many pupils are in the row?

7. Count by 2's to 14. Show with sticks how many 2's there are in 14.

8. If 1 orange costs 2 centavos, how many oranges can you buy with 14 centavos?

9. Isabel has 9 yards of white ribbon and 5 yards of red ribbon. How many yards of ribbon has she?

10. What will half a dozen lead pencils cost at 2 centavos each?

11. Write 2 times 1 are 2, 2 times 2 are 4, and so on to 2 times 7.

12. One foot is what part of one yard?

Add:

1.	2.	3.	4.	5.	6.	7.
3	6	10	5	5	8	7
9	7	4	6	9	6	7

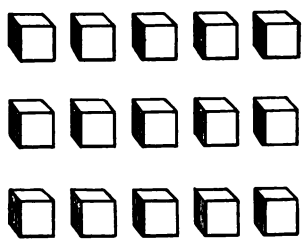
8.	9.	10.	11.	12.	13.	14.
4	5	6	3	8	3	3
7	8	6	7	2	4	10

Subtract:

1.	2.	3.	4.	5.	6.	7.
9	8	10	12	11	13	10
4	3	2	7	4	8	6

8.	9.	10.	11.	12.	13.
14	13	14	13	12	14
4	9	8	3	5	9

10. Oral.



1. How many rows of cubes do you see?

2. How many cubes are in each row?

3. How many cubes are in all the rows?

4. 3 times 5 cubes are . . . $\frac{1}{3}$ of 15 is . . .

5. There are . . . fives in fifteen.

6. In 1 yard there are . . . feet. In 5 yards there are . . . feet. 5 times 3 are . . .

7. There are . . . trees in the picture.

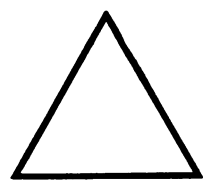
8. How many palm trees are there?

9. If 3 trees are cut down, how many trees will be left?

10. In my yard there are 7 banana trees, 5 palm trees, and 3 chico trees. How many trees are in my yard?

11. Paz took 15 eggs to market and sold $\frac{1}{3}$ of them. How many eggs did she sell?

12. This is a triangle. A triangle has . . . sides. 5 triangles have . . . sides.



13. How many triangles can you make with 12 sticks?

14. Count by 3's to 15. Count by 5's to 15.

15.	$3+10=$	$12+\cdot=15$	$6+\cdot=15$
16.	$9+6=$	$8+7=$	$7+\cdot=15$
17.	$13+\cdot=15$	$5+10=$	$11+3=$
18.	$10+\cdot=15$	$7+6=$	$9+\cdot=15$
19.	$7+7=$	$\frac{1}{3}$ of $15=$	$11+4=$

11. Oral.

1. Fifteen and one are . . .

2. Luz and Josefa have 16 centavos. Luz has 14 centavos, and Josefa has . . . centavos.

3. One dozen and four are how many?

4. Count by 2's to 16.

5. There are . . . twos in sixteen.

6. 8 carts have how many wheels?

7. How many wings have 8 birds?

8. Draw 4 squares. How many sides have 4 squares? How many corners have 4 squares?

9. There are . . . 4's in 16. $\frac{1}{4}$ of 16 is . . .

10. How many times can you count 8 butterflies in the picture?

11. $\frac{1}{2}$ of 16 butterflies is . . .

12. There are . . . eights in sixteen.

13. I see 2 houses. In each house there are 8 windows. How many windows are in both?

Have pupils make problems about the butterflies, and lay sticks to show how many 2's, 4's, and 8's there are in 16.

12. Oral.

1.	15+ 1=	9+·=15	5+11=
2.	10+ ·=16	8+7=	12+ ·=16
3.	9+ 7=	4+9=	13+ 3=
4.	6+ 7=	7+9=	8+ ·=16
5.	3+12=	10+·=14	2+11=

Add:

1. 2	2. 6	3. 8	4. 4	5. 7	6. 2	7. 9	8. 3
8	6	1	3	3	10	4	2
4	4	6	9	5	3	2	10

Subtract:

1. 15	2. 16	3. 16	4. 16	5. 15	6. 16
9	8	7	3	8	14

This sign (×) is called *times.*

1.	2×1=	2×5=	3×1=	$\frac{1}{2}$ of 8=
2.	2×2=	2×6=	3×2=	$\frac{1}{3}$ of 9=
3.	2×3=	2×7=	3×3=	$\frac{1}{4}$ of 12=
4.	2×4=	2×8=	3×4=	$\frac{1}{3}$ of 15=
5.	4×1=	4×3=	3×5=	$\frac{1}{2}$ of 16=
6.	4×2=	4×4=	5×2=	$\frac{1}{2}$ of 12=
7.	6×2=	7×2=	5×3=	$\frac{1}{3}$ of 12=

13. Oral.

1. Sixteen and one are seventeen.

2. There are 10 trees in one row and 7 trees in another row. In both rows there are . . . trees.

3. One dozen and five eggs are how many eggs?

4. In 2 weeks and 3 days there are . . . days.

5. Maria is 13 years old, and her sister is 4 years older. How old is her sister?

6. One foot and . . . inches are 17 inches.

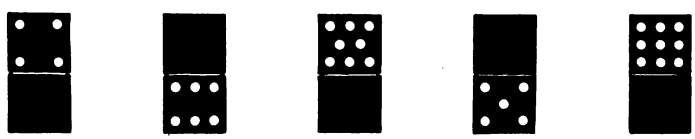
7. I had 17 books and sold 8 of them. I then had . . . books.

8. Mr. Asico set out 2 rows of banana trees, putting 8 trees in each row. How many trees did he set out?

Add:

9.	10.	11.	12.	13.	14.	15.
8	10	5	6	4	12	2
9	7	8	11	13	5	15

16. What is $\frac{1}{2}$ of 16? $\frac{1}{4}$ of 16? $\frac{1}{3}$ of 15?



Let the pupils copy the pictures, filling in the blank half of each with enough dots to make 17 in each picture.

14. Oral.

1. Felisa and her mother have been to the market to buy some fruit. Her mother has . . . bananas and . . . mangos in her basket.

2. At 3 centavos each, what did she pay for the mangos?

3. At 10 centavos a dozen, what did the bananas cost?

4. Felisa bought 2 oranges at 2 centavos each, and 3 pieces of sugar cane at 1 centavo each. How much did she spend?

5. If Felisa had 18 centavos when she went to market, how much has she now?

6. Place 18 sticks in 2 equal piles. How many sticks are in each pile? $\frac{1}{2}$ of 18 is . . .

7. What will 2 handkerchiefs cost at 9 centavos each? $2 \times 9 =$ 9 is . . . of 18.

8. 6 triangles have how many sides?

9. A dozen and a half eggs are . . . eggs.

10. Add $\frac{1}{2}$ of 4 mangos and $\frac{1}{2}$ of 6 mangos.

Give other problems about the market.

11.	9+ 9=	15+·=18	8+ 7=	$\frac{1}{2}$ of 18=
12.	3+14=	17+·=18	16+ 2=	$\frac{1}{3}$ of 9=
13.	10+ 8=	10+·=18	11+ 7=	$\frac{1}{3}$ of 18=
14.	13+ 5=	11+·=18	15+ 3=	2×9=
15.	12+ 6=	16+·=18	12+ 4=	3×6=
16.	14+ 4=	9+·=18	1+17=	6×3=
17.	$\frac{1}{3}$+ $\frac{1}{3}$=	$\frac{1}{2}$+·=$\frac{2}{2}$	$\frac{1}{4}$+ $\frac{2}{4}$=	3×$\frac{1}{3}$=

15. Oral.

1. Count 19. Eighteen and . . . are nineteen.

2. Leon had 17 centavos and he found 2 centavos. He then had . . . centavos.

3. 2 weeks and . . . days are 19 days.

4. I see 19 little chickens. 13 chickens are black and the rest are white. How many white chickens do I see?

5. One foot and 7 inches are . . . inches.

Subtract:

6. 19	7. 19	8. 19	9. 19	10. 19	11. 19
14	10	7	15	18	12
12. 18	13. 19	14. 19	15. 19	16. 17	17. 19
15	9	11	17	13	5

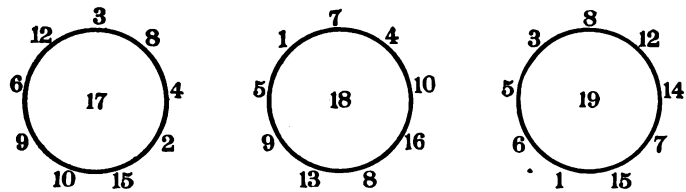
Give other problems like 2, 3, 4, and 5.

REVIEW OF NUMBERS TO 20

16. Oral.

Add:

1.	2.	3.	4.	5.	6.	7.	8.
2	3	6	8	7	5	4	2
4	3	1	2	10	4	3	3
7	9	6	5	2	5	9	2
6	2	5	1	1	2	1	10



Place the circles on the blackboard for rapid drill work in subtraction. When the teacher points to one of the numbers around a circle, a pupil tells what number added to it will give the number within. For example, when the pointer is on 10 outside the first circle, the pupil thinks "10 and 7 are 17," and answers 7. Let the whole class stand. Pass quickly from one number to another, and from one pupil to another.

9. Benito took 18 centavos to the market. He paid 1 centavo each for 11 chicos. How many centavos were left?

10. There were 17 oranges on a tree. 5 fell to the ground. How many oranges were left on the tree?

11. I had 19 bananas. I gave 9 to my sister. I then had . . . bananas.

Have the pupils write the table of 2's to 2×9, 3's to 3×6, 4's to 4×4. 5's to 5×3.

NUMBERS FROM 20 TO 100

17. Oral.

1. How many sticks do you see?

2. How many tens do you see?

3. There are . . . tens in twenty (20).

4. Lay 2 tens with your sticks.

5. Benito and Conrado have 10 centavos each. How many centavos have both boys?

6. A man had 20 gantas of rice and sold $\frac{1}{2}$ of it. How many gantas did he sell?

7. Count by 2's, 4's, 5's, and 10's, to 20.

8. Find with your sticks how many 2's, 4's, 5's, and 10's there are in 20.

9. Here are . . . tens.

10. 3 tens are called thirty (30); 4 tens, forty (40); 5 tens, fifty (50); 6 tens, sixty (60); 7 tens, seventy (70); 8 tens, eighty (80); 9 tens, ninety (90); 10 tens, one hundred (100).

11. Count by tens to one hundred.

12. One peso is worth 100 centavos.

13. How many 10-centavo pieces can you get for 1 peso?

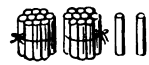
14. How many tens are there in 50? In 30? In 80? In 40? In 100? In 60? In 70?

18. Oral.

1. How many tens are in the first picture? How many ones? The ones are called units.

2. This number is twenty-one (21).

3. In the second picture there are . . . tens and . . . units.



4. This number is twenty-two (22).

5. In twenty-three (23) there are 2 tens and 3 units.

6. The left-hand figure tells how many tens there are in a number. The right-hand figure tells how many units.

7. With your sticks show how many tens and how many units there are in 25, 26, 27, 28, 29.

8. Read these numbers and tell how many tens and how many units there are in each:

23	38	48	21	32	52	40	18
35	22	33	55	49	45	13	28
42	47	27	41	53	20	31	58
64	75	66	83	78	94	60	99

9. Open your book to pages forty-nine, sixty-seven, eighty-two, thirty-three, seventy-four.

Drill on the spelling and the pronunciation of all new number names. Give numbers orally to be written in figures by the pupils. Count 100.

19. Written.

Write in figures:

1. Thirteen.
2. Twenty-one.
3. Forty.
4. Twelve.
5. Thirty-two.
6. Eighteen.
7. Fifty-two.
8. Seventeen.
9. Twenty-nine.
10. Sixty-six.
11. Thirty-five.
12. Nineteen.
13. Seventy-five.
14. Four.
15. Forty-seven.
16. Sixteen.
17. Eleven.
18. Fifty-eight.
19. Thirty-six.
20. Eighty-eight.
21. Ninety-four.
22. Twenty-three.

Write the number that tells:

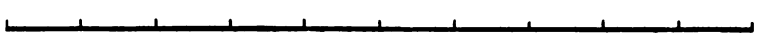
23. How many desks there are in the schoolroom.
24. How many shells there are in one window.
25. How many pupils there are in your class.
26. How many years old you are.
27. How many centavos there are in a half-peso.
28. How many words there are on this page.

Write the numbers between 30 and 50.

Write the numbers between 70 and 90.

Give other exercises like 23, 24, 25, 26, 27, and 28.

METRIC MEASURES



20. Oral.

1. Here are two lines.

The short line is 1 centimeter long.

The long line is 10 centimeters long.

10 centimeters are 1 decimeter.

2. Cut a stick 1 decimeter long. Mark the centimeters on your stick.

3. How many centimeters wide is your book?

4. How many centimeters long is your finger?

5. How many decimeters wide is your desk?

6. How many decimeters are there in one edge of your handkerchief?

7. Cut a stick 10 decimeters long. This stick is 1 meter long. Mark the decimeters on it.

8. Can you jump 1 meter?

9. With your meter stick find the length of your schoolhouse; the blackboard; the door.

10. Measure around your wrist, your neck, and your waist.

10 centimeters = 1 decimeter.

10 decimeters = 1 meter.

Give many exercises in measuring with these units.

ADDITION

21. Oral.

1. Rosario has eggs to sell. She has 20 eggs in her basket and . . . eggs in her hand. How many eggs has she?

2. If she sells 10 eggs at 2 centavos each, she will get . . . centavos.

3. When she has sold all of the eggs, she will buy a string of beads for 20 centavos, and a fan for 5 centavos. How much will her beads and fan cost?

4. $20+1=$ $30+2=$ $50+3=$ $20+4=$

5. $40+5=$ $30+6=$ $20+7=$ $30+8=$

6. Rosario's brother goes with her to the market and takes bananas to sell. There are 20 small bananas and 3 large bananas in his basket. How many bananas has he?

7. If he sells the small bananas at 1 centavo each and the large ones at 2 centavos each, how much will he get?

Give many examples similar to 4 and 5, and require the answers to be given rapidly.

Add:

8.	9.	10.	11.	12.	13.
20	30	60	50	10	40
40	10	30	20	70	40

14. $\frac{1}{3}$ of 12 = $\frac{1}{4}$ of 12 = $\frac{1}{2}$ of 20 = $\frac{1}{4}$ of 20 =

22. Oral.

1. There were 21 birds in one tree and 3 birds in another. How many birds were in both trees?

2. Julio's brother is 21 years old. In 4 years he will be . . . years old.

3. Pablo has 31 small fish and 5 large fish. How many fish has he?

Add:

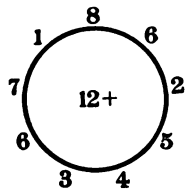
4.	5.	6.	7.	8.	9.
21	31	51	41	31	21
1	2	3	4	5	6

10.	11.	12.	13.	14.	15.
31	61	31	71	21	31
7	7	8	8	9	9

23. Written.

Add the units and the tens separately:

1.	2.	3.	4.	5.	6.
11	20	32	24	13	15
13	14	21	20	32	20



24. Oral.

Drill with the circle on the blackboard before beginning this lesson. Write within the circle 22, 32, 42, etc., until the pupils can add rapidly to numbers ending in 2.

1. Count by 10's from 2 to 92.

2. A flagpole 4 meters long was placed on a schoolhouse 12 meters high. How high was the top of the pole?

3. The school paid 52 centavos for the rope to pull up the flag, and 10 centavos for the pole. What was the cost of both?

Add:

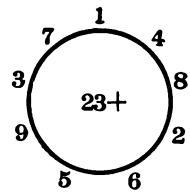
4.	12	22	32	22	42	32	22	52
	1	2	3	4	5	6	7	7
5.	12	22	42	62	2	12	22	42
	8	8	8	8	9	9	9	9

6. Francisco counted 32 banana trees and 6 palm trees in the school yard. How many trees were in the yard?

7. Benito counted 7 steps from the ground to the first floor of the schoolhouse and 22 from the first to the second floor. How many steps did he count from the ground to the second floor?

25. Oral.

Use the circle for drill, as on page 64. Write within it 33, 43, 53, etc.



1. Andres had 23 centavos in his pocket and 1 centavo in his hand. How many centavos had he?

2. A large basket holds 23 chupas, and a small basket holds 4 chupas. Both baskets hold . . . chupas.

3.	$23+1=$	$13+2=$	$33+2=$	$23+2=$
4.	$53+3=$	$23+4=$	$33+4=$	$23+5=$
5.	$33+5=$	$13+6=$	$23+6=$	$43+6=$

Add:

6. 31	7. 32	8. 33	9. 43	10. 21	11. 22
7	7	7	7	8	8
12. 23	13. 53	14. 21	15. 22	16. 23	17. 43
8	8	9	9	9	9

26. Written.

Add:

1. 12	2. 22	3. 40	4. 53	5. 62	6. 17
13	36	16	14	25	80
7. 38	8. 50	9. 22	10. 66	11. 15	12. 43
31	19	24	20	33	23

27. Oral.

1. How many eggs are there in a dozen? In a half dozen? In 2 dozen?

2. How many 6's are there in 12? In 24?

3. I have 24 nuts in a basket and 4 nuts in my hand. How many nuts have I?

4. How many twos can I count with the nuts in the basket?

5. How many girls can take 6 nuts each from the basket?

6. $\frac{1}{2}+\frac{1}{2}=$ $\frac{1}{4}+\frac{1}{4}=$ $2\times 7=$ $2\times 10=$

7. $\frac{1}{3}+\frac{1}{3}=$ $\frac{2}{4}+\frac{1}{4}=$ $2\times 8=$ $2\times 11=$

8. $\frac{1}{3}+\frac{1}{3}=$ $\frac{3}{4}+\frac{1}{4}=$ $2\times 9=$ $2\times 12=$

9. Count by 2's, 3's, 4's, and 6's to 24.

Add:

10. 24	11. 34	12. 44	13. 14	14. 24	15. 24
3	4	5	6	6	7
16. 34	17. 4	18. 24	19. 4	20. 24	21. 34
7	8	8	9	9	9

22. Count by 10's from 4 to 94.

Drill with a circle, as on pages 64 and 65.

28. Oral.

Add:

1. 25	2. 65	3. 45	4. 35	5. 5	6. 25
1	2	3	4	5	5
7. 45	8. 5	9. 25	10. 35	11. 5	12. 25
5	6	6	6	7	7
13. 45	14. 5	15. 25	16. 35	17. 15	18. 25
7	8	8	8	9	9

19. Count by 5's to 100.

20. Count by 10's from 5 to 95.

21. A little girl has 4 large beads and 25 small beads. How many beads has she?

22. How many 5's are there in 15? In 20? In 25?

23. In a school in Paco there were 35 boys. Six more boys came to the school. How many boys were then in the school?

29. Written.

Add:

1. 15	2. 25	3. 43	4. 73	5. 35	6. 23
12	32	15	14	13	54

Have the pupils write the table of 5's to 5 × 10.

30. Oral.

1. Juan has 46 matches in a box and 7 matches in his hand. How many matches has he?

2. At 2 centavos each, what will half a dozen boxes of matches cost?

3. What will be the cost of a dozen boxes?

4. If Juan bought 8 boxes and gave the clerk 20 centavos, how many centavos did he get in change?

5.	$26+1=$	$26+2=$	$26+3=$	$16+4=$
6.	$26+4=$	$36+4=$	$6+5=$	$26+5=$
7.	$36+5=$	$46+5=$	$6+6=$	$16+6=$
8.	$26+6=$	$6+7=$	$16+7=$	$26+7=$
9.	$36+7=$	$6+8=$	$16+8=$	$26+8=$
10.	$6+9=$	$16+9=$	$26+9=$	$36+9=$
11.	$\frac{1}{2}$ of $10=$	$\frac{1}{2}$ of $12=$	$\frac{1}{2}$ of $14=$	$\frac{1}{2}$ of $16=$

31. Written.

Add:

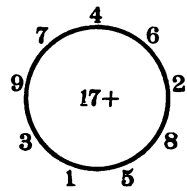
1.	2.	3.	4.	5.	6.
16	26	36	76	46	25
21	43	22	10	53	34

Give other oral problems about the matches.

32. Oral.

Use the circle for drill, as on page 64. Write within it 27, 37, 47, etc.

1. In 27 there are ... tens and ... units.



2. I see 7 pens in a box and 4 pens on the table. How many pens do I see?

3. Count by 10's from 7 to 97.

4. There were 37 small candles and 5 large candles in a church. How many candles were in the church?

5. Felisa paid 17 centavos for potatoes and 6 centavos for tomatoes. What did she spend?

Add:

6. 7	7. 27	8. 27	9. 47	10. 17	11. 27
3	3	4	4	5	5
12. 17	13. 27	14. 27	15. 37	16. 17	17. 27
6	6	7	7	8	8

33. Written.

Add:

1. 7	2. 3	3. 2	4. 6	5. 13	6. 21
2	8	7	7	24	35
5	7	9	8	12	13

34. Oral.

1. Count to 28 by 2's and 4's.

2. In 38 there are . . . tens and . . . units.

3. 28 chickens are under a tree and 2 are on a box. How many chickens are there?

4. $8+4=$ $8+5=$ $8+6=$ $8+7=$

5. How many bells are 8 bells and 28 bells?

6. There are 28 girls in one room and 6 girls in another room. How many girls are in both rooms?

Add:

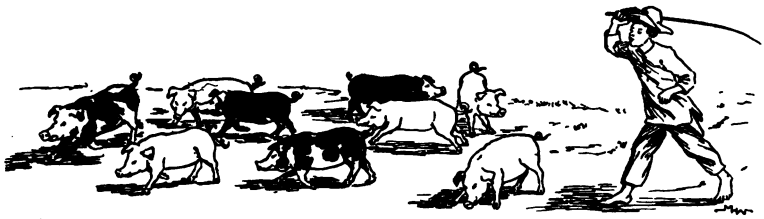
7. 28	8. 38	9. 28	10. 48	11. 18	12. 28
2	2	3	3	4	4
13. 28	14. 38	15. 8	16. 28	17. 28	18. 38
5	5	6	6	7	7
19. 8	20. 28	21. 48	22. 8	23. 28	24. 38
8	8	8	9	9	9

35. Written.

1. $18+21=$ $42+16=$ $47+32=$

2. $28+30=$ $33+26=$ $48+41=$

In the last two exercises, teach the pupils to write in columns before adding.



36. Oral.

1. How many pigs is Justo driving?

2. Justo's father had 19 pigs in a large pen. Nine of them got out and ran away. How many pigs were left in the pen?

3. If each pig is worth 2 pesos, how much can he get for the pigs that Justo is driving?

4. If he has 19 pigs and buys 5 more, he will then have . . . pigs.

5.	9+1=	19+1=	29+1=	39+1=
6.	9+2=	19+2=	29+2=	39+2=
7.	9+3=	19+3=	29+3=	39+3=
8.	9+4=	19+4=	29+4=	39+4=
9.	9+5=	19+5=	29+5=	39+5=
10.	9+6=	19+6=	29+6=	49+6=
11.	9+7=	19+7=	29+7=	59+7=
12.	9+8=	19+8=	29+8=	49+8=
13.	9+9=	19+9=	29+9=	59+9=

Let the pupils make problems about the pigs.

REVIEW

37. Oral.

Add:

1. 9 7	2. 27 3	3. 15 7	4. 21 6	5. 13 8	6. 22 9
7. 28 5	8. 46 4	9. 38 7	10. 56 3	11. 72 8	12. 91 5

13. Count by 2's to 30. Count by 3's to 36.

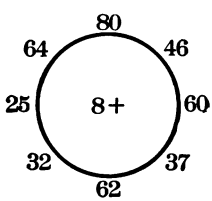
14. Count by 4's to 48. Count by 5's to 100.

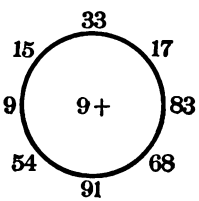
15. A boy sells 24 fish on Monday and 7 on Tuesday. How many fish does he sell in two days?

16. In a small room there are 8 desks, and in a large room there are 17 desks. In both rooms there are . . . desks.

17. One hen has 9 chickens and another hen has 14. Both hens have how many chickens?

18. One third of 21 chickens is . . . chickens.





Write different numbers within the circles for drill in addition. Require answers to be given rapidly.

19. $\frac{1}{4}$ of 16 = $\frac{1}{4}$ of 20 = $\frac{1}{2}$ of 16 = $\frac{1}{3}$ of 18 =

20.	21.	22.	23.	24.	25.
40	30	80	50	60	10
10	30	10	50	20	50

38. Written.

Write in words: 35, 46, 22, 78, 54, 9, 47, 39.

Write in figures:

1. Thirty-seven.
2. Twenty-nine.
3. Fourteen.
4. Eighty-seven.
5. Ninety-three.
6. Seventy-one.
7. Fifty-five.
8. Sixty-four.

Add:

9.	10.	11.	12.	13.	14.	15.
6	7	2	3	4	7	9
3	9	1	8	7	7	1
8	2	5	8	8	6	8
4	3	8	4	9	2	4
10	6	13	15	2	9	5

16.	17.	18.	19.	20.	21.
25	72	30	18	54	10
34	16	47	81	24	80

22.	23.	24.	25.	26.	27.
71	46	16	52	13	33
15	32	63	27	80	55

SUBTRACTION

39. Oral.

1. Alfredo is buying a loaf of bread for 3 centavos. He gives the baker a 5-centavo piece. How many centavos in change will he get?

2. Dolores has come for some cakes. What must she pay for 6 cakes at 1 centavo each? If she gives the baker a 10-centavo piece, how much change will she get?

Subtract:

3.	4.	5.	6.	7.	8.	9.
8	5	9	7	8	9	6
3	4	2	5	6	7	4
−	−	−	−	−	−	−

10. If the baker makes 10 cakes and sells $\frac{1}{2}$ of them, how many are left?

Subtraction has been introduced by the "building-up" method, as change is made in the stores. Pupils find it easier to ascertain the difference between two numbers by going forward from the smaller to the larger, than by "taking away" one number from the other. See Part I, page 37, note. In example 3 some teachers may prefer to have the pupil say, "3 from 8 leaves 5," instead of "3 and 5 are 8."

40. Oral.

The sign of subtraction (−) is called *minus*.
5−2=3 is read, 5 minus 2 equals 3.

1. 7−4= 8−2= 6−3= 9−6=
2. 6−1= 9−4= 8−5= 7−3=
3. 8−4= 5−5= 6−5= 8−7=

4. I had 12 pins. I gave Maria 5 pins. Now I have . . . pins.

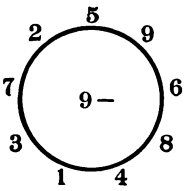
5. Paula has 13 nuts. If she eats 3 nuts, she will have . . . nuts left.

6. There were 11 spoons on the table. Josefa took away 4 of them and left . . .

7. Juan had 10 pens. He gave me 2 pens. How many pens had he then?

8. 10−3= 4−3= 7+·=10
9. 11−4= 11−3= 6+·=11
10. 12−6= 13−6= 8+·=14
11. 15−5= 14−8= 7+·=11
12. 12−2= 8−1= 6+·=10
13. 13−5= 10−5= 11+·=13
14. $\frac{2}{2}-\frac{1}{2}=$ $\frac{2}{4}-\frac{1}{4}=$ 5+·= 9
15. $\frac{3}{4}-\frac{1}{4}=$ $\frac{2}{3}-\frac{1}{3}=$ 7+·=12

Oral exercises like those above should be continued until the pupils can perform quickly any subtractions involving numbers to 20. Give many oral problems similar to 4, 5, 6, and 7.



41. Oral.

Use the circle for rapid drill in subtraction. When the teacher points to a number outside the circle, a pupil states the difference between that number and 9. For example, when the pointer is on 3, the pupil says 6. Use within the circle 19, 29, 39, 49, etc.

1. Pedro had 9 centavos. He paid 5 centavos for a top and had . . . centavos left.

2. There were 19 birds in a tree. 7 flew away. How many were left in the tree?

3. Josefa's mother weaves 29 yards of sinamay. She sells 24 yards and has . . . yards left.

4. I have 17 nuts. How many more must I have to make 19 nuts?

Subtract:

5. 19	6. 19	7. 19	8. 19	9. 19	10. 19
3	5	9	10	8	6
11. 19	12. 19	13. 19	14. 19	15. 19	16. 19
12	17	11	16	18	14

42. Written.

Subtract the units, then the tens:

1. 29	2. 29	3. 39	4. 49	5. 49	6. 59
13	21	15	24	36	23

43. Oral.

Subtract:

1. 8	2. 8	3. 8	4. 8	5. 8	6. 8	7. 8
1	2	3	4	5	6	7
8. 18	9. 18	10. 18	11. 18	12. 18	13. 18	
11	12	13	14	15	16	

14. $8 + \cdot = 18$ $9 + \cdot = 18$ $10 + \cdot = 18$

15. $2\frac{1}{2} + \cdot = 3$ $3\frac{1}{2} + \cdot = 4$ $4\frac{1}{2} + \cdot = 5$

16. Felisa has 18 eggs in her basket. If I buy 2 eggs, how many has she then?

17. I have a string 8 inches long. If I cut off 5 inches, how long will the string be?

18. I see 28 beads. 25 beads are white and the rest are red. How many red beads do I see?

44. Written.

Subtract:

1. 28	2. 38	3. 48	4. 58	5. 68	6. 78
13	21	36	15	47	54

7. $19 + \cdot = 28$ $29 + \cdot = 38$ $39 + \cdot = 48$

8. $49 + \cdot = 58$ $59 + \cdot = 68$ $69 + \cdot = 78$

Let the pupils write exercises 7 and 8 in the form given, supplying the missing numbers.

45. Oral.

1. Basilio is 16 years old, and his sister is 2 years younger. How old is his sister?

2. There are 17 gantas of oil in a tank. Leon dips out 5 gantas. How many gantas are left in the tank?

3. I have 27 seeds. If I plant 6 seeds, how many will be left?

Subtract:

4. 16 − 6	5. 16 − 7	6. 16 − 8	7. 16 − 9	8. 26 − 7	9. 36 − 8
10. 17 − 7	11. 17 − 8	12. 17 − 9	13. 27 − 7	14. 37 − 28	15. 47 − 39

In giving example 14 and similar examples orally, let the pupil say "28 and 9 are 37," etc.

46. Written.

1. A man paid 32 pesos for a bed and 17 pesos for a table. What did he pay for both?

2. A boy had 46 pictures. He gave away 13. How many had he then?

3. A pig and a cow cost 67 pesos. The pig cost 13 pesos. What was the cost of the cow?

47. Oral.

1. There are 6 gantas of water in the large jar. The small jar will hold 2 gantas or . . . chupas. If Isabel fills the small jar with water from the large jar, how much water will be left in the large jar?

2. Her cup holds 2 chupas. One ganta of water will fill her cup . . . times.

3. How many times can she fill her cup from the small jar of water?

48. Written.

Subtract:

1. 36	2. 56	3. 76	4. 47	5. 67	6. 87
21	34	52	33	45	36
7. 88	8. 97	9. 86	10. 79	11. 68	12. 77
42	34	43	38	25	13

Give other problems about the picture.

49. Oral.

Subtract:

1. 14	2. 14	3. 14	4. 14	5. 14	6. 14
5	6	7	8	9	10
7. 15	8. 15	9. 15	10. 15	11. 25	12. 35
5	6	7	8	9	30

13. A boy caught 14 small fish, and sold 4 of them. How many were left?

14. There are 25 bananas in two bunches. In one bunch there are 7. How many are in the other?

15. At 3 centavos each, what will 5 mangos cost?

16. There are 34 candles in a church. Three candles are burning. How many are not burning?

Subtract:

17. 24	18. 34	19. 54	20. 75	21. 45	22. 95
20	30	50	70	40	90
23. 36	24. 66	25. 47	26. 77	27. 28	28. 98
30	20	40	70	20	90

Give frequent drills in subtracting numbers 1 to 9 from the numbers 11 to 20. Pupils find these subtractions most difficult.

50. Written.

Subtract:

1. 34	2. 64	3. 75	4. 56	5. 94	6. 85
12	33	42	31	71	55
7. 84	8. 77	9. 98	10. 65	11. 95	12. 79
44	33	83	34	73	15

51. Oral.

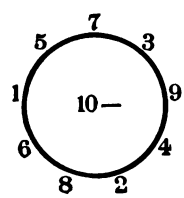
1. A farmer had 13 pigs. When 7 pigs died, how many were left?

2. There are 8 gantas of water in a 12-ganta jar. How many more gantas of water can I put into the jar?

3. Ramon had 13 centavos. He bought 6 chicos at 1 centavo each. How much had he left?

4. Castro had 15 nuts. He ate $\frac{1}{3}$ of them, gave away $\frac{1}{3}$, and had . . . nuts left.

5.	$8+\cdot=10$	$4+\cdot=10$	$3+\cdot=10$
6.	$6+\cdot=11$	$7+\cdot=11$	$8+\cdot=11$
7.	$3+\cdot=12$	$8+\cdot=12$	$5+\cdot=12$
8.	$5+\cdot=13$	$7+\cdot=13$	$9+\cdot=13$



Use the circle for drill in subtraction, as on page 76. Write within it 11, 12, and 13. Require answers instantly.

52. Oral.

1. There were 80 cocoanuts in a banca. Eleven of them fell into the water. How many cocoanuts were then in the banca?

2. If the man rows 3 miles an hour, how far will he row in 5 hours?

3. If he sells the cocoanuts at 6 centavos each, how much will he get for half a dozen?

4. If the man earns 4 pesos a week by rowing the boat, what will he earn in a month?

5. $19+\cdot=20$ $19+\cdot=21$ $19+\cdot=22$ $19+\cdot=23$

6. $18+\cdot=20$ $18+\cdot=21$ $18+\cdot=22$ $18+\cdot=23$

7. $17+\cdot=20$ $17+\cdot=21$ $17+\cdot=22$ $17+\cdot=23$

8. $16+\cdot=20$ $16+\cdot=21$ $16+\cdot=22$ $16+\cdot=23$

9. $15+\cdot=20$ $15+\cdot=21$ $15+\cdot=22$ $15+\cdot=23$

10. $14+\cdot=20$ $14+\cdot=21$ $14+\cdot=22$ $14+\cdot=23$

11. Find $\frac{1}{3}$ of 21; $\frac{1}{2}$ of 22; $\frac{1}{4}$ of 40; $\frac{1}{2}$ of 24.

12. $1\frac{1}{2}+\frac{1}{2}=$ $2\frac{1}{2}+\frac{1}{2}=$ $4\frac{1}{2}+\frac{1}{2}=$ $6\frac{1}{2}+\frac{1}{2}=$

Place the exercises 5 to 12 on the board. After taking them in regular order, use the pointer and ask for them out of their regular order.

REVIEW OF ADDITION AND SUBTRACTION

53. Oral.

1.	18 − 13 =	68 − 65 =	38 − 7 =	84 − 82 =
2.	27 − 2 =	33 − 7 =	25 − 8 =	93 − 3 =
3.	15 − 7 =	28 − 20 =	73 − 6 =	69 − 9 =
4.	39 − 34 =	17 − 15 =	56 − 5 =	46 − 8 =
5.	21 − 5 =	72 − 2 =	94 − 9 =	27 − 9 =
6.	36 − 9 =	45 − 6 =	55 − 8 =	52 − 3 =
7.	19 − 7 =	62 − 9 =	39 − 34 =	66 − 6 =
8.	27 − 8 =	75 − 71 =	91 − 2 =	69 − 61 =

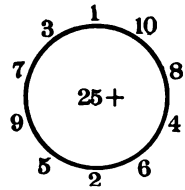
Subtract:

9. 31	10. 42	11. 50	12. 66	13. 24	14. 56
7	2	47	65	6	7
15. 23	16. 35	17. 37	18. 42	19. 93	20. 39
3	9	5	4	89	35

21. A man bought 90 stones to build a wall. How many stones did he use if he had 7 stones left?

22. Mr. Cid has 48 mangos. Five are large and the rest are small. How many small mangos has he?

23. A farmer had 37 cows. Eight cows died. How many had he then?



Place the circle on the blackboard. Write within the circle any of the numbers from 10 to 100. Drill in addition and subtraction.

54. Written.

Add:

1. 43	2. 71	3. 36	4. 50	5. 16	6. 23
54	28	53	39	80	44
7. 21	8. 47	9. 12	10. 24	11. 30	12. 3
13	20	41	32	14	24
34	11	46	3	21	20

Subtract:

13. 95	14. 76	15. 87	16. 69	17. 58	18. 75	19. 88
32	24	46	32	41	63	87
20. 48	21. 67	22. 46	23. 73	24. 89	25. 57	26. 66
33	25	26	50	26	16	25

27. Count by 2's to 50. Count by 3's to 45.

28. Count by 4's to 48. Count by 5's and 10's to 100.

29. $1\frac{1}{2}+1\frac{1}{2}=$ $3+1\frac{1}{2}=$ $4+2\frac{1}{2}=$ $5+4\frac{1}{2}=$

Much of the abstract written work from this time should be dictated by the teacher and placed on the board by the pupils.

55. Written.

1. There are 20 stones on the cart. How many stones are there on the cart and on the ground?

2. If 12 stones will build 1 meter of wall, how many will it take to build 3 meters of wall?

3. If one man earns ₱ 1 a day and the other ₱ 1.25 a day, what do both men earn in a day?

4. How many sides has one stone? How many corners have three stones?

5. There are 30 days in April, 31 in May, and 30 in June. In the three months there are . . . days.

6. Mr. Solis had 47 cavanes of rice. He gave 15 cavanes to his son and had . . . cavanes left.

7. A baker made 32 cakes on Monday, 25 on Tuesday, and 30 on Wednesday. How many cakes did he make in the three days?

8. Maria's mother had 27 yards of sinamay. She used 22 yards for a dress and had . . . yards left.

MULTIPLICATION

56. Oral.

1. At 2 centavos each, what will 3 oranges cost?

If 1 orange costs 2 centavos, 3 oranges will cost 3 times 2 centavos, or 6 centavos.

2. If Leon earns 5 pesos in one week, how much does he earn in two weeks?

If Leon earns 5 pesos in one week, in 2 weeks he earns 2 times 5 pesos, or 10 pesos.

3. What will 3 loaves of bread cost at 6 centavos each?

4. How many wings have 4 birds?

5. How many horns have 6 carabaos?

6. At 7 centavos a pound, what must I pay for 2 pounds of sugar?

7. $3 \times 3 =$ $4 \times 4 =$ $3 \times 5 =$ $5 \times 2 =$

8. Juana buys 2 cakes of soap at 8 centavos a cake. How much does she pay?

9. How many chicos are there in 2 dozen?

10. How much will 5 coats cost at 3 pesos each?

11. At 5 pesos a week, how much board do I pay in a month? How many weeks in a month?

12. $2 \times 8 =$ $6 \times 2 =$ $4 \times 3 =$ $2 \times 10 =$

2× 1= 2	3× 1= 3	4× 1= 4	5× 1= 5	6× 1= 6
2× 2= 4	3× 2= 6	4× 2= 8	5× 2=10	6× 2=12
2× 3= 6	3× 3= 9	4× 3=12	5× 3=15	6× 3=18
2× 4= 8	3× 4=12	4× 4=16	5× 4=20	6× 4=24
2× 5=10	3× 5=15	4× 5=20	5× 5=25	6× 5=30
2× 6=12	3× 6=18	4× 6=24	5× 6=30	6× 6=36
2× 7=14	3× 7=21	4× 7=28	5× 7=35	6× 7=42
2× 8=16	3× 8=24	4× 8=32	5× 8=40	6× 8=48
2× 9=18	3× 9=27	4× 9=36	5× 9=45	6× 9=54
2×10=20	3×10=30	4×10=40	5×10=50	6×10=60
2×11=22	3×11=33	4×11=44	5×11=55	6×11=66
2×12=24	3×12=36	4×12=48	5×12=60	6×12=72

57. Oral.

1. Learn the tables of 2's and 3's.

2. How many days are there in 1 week? In 2 weeks?

3. How many chupas are there in 2 gantas? In 3 gantas?

4. 3 times 11 centavos are how many centavos?

5. How many 3's are there in 18? In 24?

6. How many feet have 8 birds?

7. How many inches are there in 2 feet?

8. How many feet are there in 1 yard? In 9 yards?

9. What will 10 cakes cost at 2 centavos each?

Give frequent oral drills on the tables. Do not ask for products in the order given in the tables. Give oral problems involving the tables learned. Emphasize the point that $3 \times 2 = 2 \times 3$, etc.

10. $2\times 4=$ $3\times 6=$ $2\times 9=$ $8\times 2=$

11. $5\times 3=$ $7\times 2=$ $4\times 2=$ $9\times 3=$

12. $2\times 6=$ $4\times 3=$ $10\times 2=$ $3\times 7=$

13. $2\times 11=$ $6\times 3=$ $3\times 12=$ $2\times 12=$

58. Written.

Multiply the units, then the tens:

1.	2.	3.	4.	5.	6.
21	32	24	40	43	44
2	2	2	2	2	2

7.	8.	9.	10.	11.	12.
30	21	13	23	22	32
3	3	3	3	3	3

59. Oral.

1. Learn the table of 4's.

2. How many fingers are there on 4 hands?

3. In 4 meters there are . . . decimeters.

4. What will 2 yards of ribbon cost at 4 centavos a yard?

5. A cook earned 7 pesos in one week. What did he earn in 4 weeks?

6. There are 8 girls in a class. Each girl writes 4 lines. How many lines do they all write?

7. A boy had 16 marbles and found 4. How many marbles had he then?

8. Alfonso is 10 years old. In how many years will he be 14?

9.	$4 \times 5 =$	$6 \times 4 =$	$3 \times 9 =$	$4 \times 4 =$
10.	$2 \times 11 =$	$4 \times 7 =$	$5 \times 4 =$	$7 \times 3 =$
11.	$4 \times 11 =$	$7 \times 4 =$	$3 \times 12 =$	$2 \times 8 =$
12.	$3 \times 6 =$	$4 \times 9 =$	$8 \times 4 =$	$9 \times 4 =$
13.	$10 \times 4 =$	$11 \times 4 =$	$12 \times 4 =$	$11 \times 3 =$

60. Written.

Multiply:

1.	2.	3.	4.	5.	6.
34	20	20	22	42	33
2	3	4	4	2	3

Add:

7.	8.	9.	10.	11.	12.
14	40	25	11	24	34
23	18	42	75	63	60
52	31	30	13	10	5

Subtract:

13.	14.	15.	16.	17.	18.
78	95	83	67	39	56
34	61	23	25	33	40

61. Oral.

1. Alipio is in the garden. He is getting radishes and tomatoes to take to the market. If he ties 5 radishes in each bunch, how many radishes will he need to make 5 bunches?

2. At 10 centavos a bunch, how much will he get for 5 bunches of radishes?

3. If he sells 3 tomatoes for 5 centavos, how many tomatoes will he sell for 10 centavos?

4. At 3 for 5 centavos, what must I pay for a dozen tomatoes?

5. Learn the table of 5's.

Multiply:

6. 9 5	7. 5 4	8. 7 5	9. 12 5	10. 5 8	11. 5 9
12. 5 6	13. 11 5	14. 10 5	15. 5 7	16. 5 3	17. 8 5

62. Oral.

1. Count by 6's to 72. Learn the table of 6's.

2. I have 6 hens; each hen has 10 chickens. How many chickens have I?

3. A carpenter works 8 hours each day. How many hours does he work in 6 days?

4. At 2 for a centavo, what will 12 onions cost?

5. At 5 pesos a ton, how many pesos must I pay for 6 tons of coal?

6. How many months in 5 years? In 6 years?

7.	$3\times 6=$	$7\times 2=$	$4\times 5=$	$5\times 9=$
8.	$6\times 2=$	$6\times 5=$	$6\times 8=$	$6\times 9=$
9.	$4\times 10=$	$11\times 5=$	$3\times 8=$	$7\times 6=$
10.	$2\times 12=$	$4\times 4=$	$9\times 3=$	$10\times 4=$
11.	$6\times 7=$	$6\times 11=$	$6\times 12=$	$12\times 6=$
12.	$8\times 6=$	$7\times 6=$	$6\times 6=$	$5\times 6=$

Multiply:

13. 7	14. 5	15. 6	16. 8	17. 6	18. 12
6	8	9	6	7	6
19. 8	20. 11	21. 3	22. 4	23. 4	24. 5
5	4	9	8	9	9

DIVISION

63. Oral.

1. Take 6 sticks. Lay them in groups of 2 sticks each. How many groups have you?

2. There are . . . 2's in 6.

3. How many 2's in 8? In 12? In 16?

To find how many 2's there are in a number, divide the number by 2.

$6 \div 2 = 3$ is read, 6 divided by 2 equals 3.

4. $8 \div 2 =$ $10 \div 2 =$ $12 \div 2 =$ $14 \div 2 =$

5. $16 \div 2 =$ $18 \div 2 =$ $20 \div 2 =$ $22 \div 2 =$

6. If 2 pencils cost 6 centavos, what is the cost of 1 pencil?

If 2 pencils cost 6 centavos, 1 pencil will cost as many centavos as there are 2's in 6, or 3 centavos.

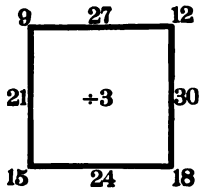
7. At 2 centavos each, how many tops can I buy for 10 centavos?

If 1 top costs 2 centavos, I can buy as many tops for 10 centavos as there are 2's in 10, or 5 tops.

8. If 1 hat costs 2 pesos, how many hats can I buy for 14 pesos?

9. The milkman puts 20 chupas of milk into cups holding 2 chupas each. How many cups does he use?

64. Oral.



1. Count by 3's to 36.

2. How many 3's are there in 12?

To find how many 3's there are in a number, divide the number by 3.

3. $3 \div 3 =$ $6 \div 3 =$ $12 \div 3 =$ $15 \div 3 =$

4. $3\overline{)9}$ is read, 9 divided by 3 equals 3.
$\quad 3$

5. $3\overline{)18}$ 6. $3\overline{)21}$ 7. $3\overline{)24}$ 8. $3\overline{)27}$ 9. $3\overline{)30}$

10. How many triangles can you make with 15 sticks?

11. At 3 centavos each, how many fish can you buy for 21 centavos?

Use the square for blackboard drill in division. Give oral problems similar to 10 and 11.

65. Written.

Divide the tens, then the units:

1. $2\overline{)28}$ 2. $2\overline{)42}$ 3. $3\overline{)39}$ 4. $3\overline{)60}$ 5. $2\overline{)80}$

6. $2\overline{)48}$ 7. $3\overline{)69}$ 8. $3\overline{)93}$ 9. $2\overline{)88}$ 10. $3\overline{)66}$

To find $\frac{1}{2}$ of a number, divide the number by 2.

11. What is $\frac{1}{2}$ of 44? Of 84? Of 68? Of 82?

12. What is $\frac{1}{3}$ of 27? Of 60? Of 93? Of 69?

66. Oral.

1. How many 4's in 8? In 12? In 16?

2. $4\overline{)20}$ 3. $4\overline{)28}$ 4. $4\overline{)36}$ 5. $4\overline{)40}$ 6. $4\overline{)48}$

7. What is $\frac{1}{4}$ of 24? Of 32? Of 44? Of 16?

8. How many 5's in 10? In 20? In 30?

9. $5\overline{)15}$ 10. $5\overline{)25}$ 11. $5\overline{)35}$ 12. $5\overline{)40}$ 13. $5\overline{)55}$

14. A man earned 20 pesos in one month. How many pesos did he earn in one week?

15. I see 20 fingers. How many hands do I see?

16. If it takes 4 yards of jusi for 1 camisa, how many camisas can be made from 24 yards?

17. How many 5-centavo pieces can you get for a half-peso?

18. Count by 6's to 72.

19. What is $\frac{1}{6}$ of 12? Of 30? Of 24? Of 60?

20. At 6 centavos each, how many papayas can I buy for 18 centavos?

21. How many 6-inch sticks can I make from a stick 1 yard long?

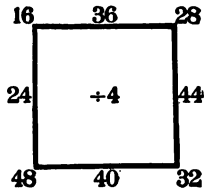
22. In 6 equal rows there are 60 lemon trees. How many trees are in each row?

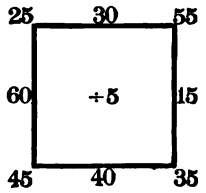
23. $6\overline{)42}$ 24. $6\overline{)54}$ 25. $6\overline{)48}$ 26. $6\overline{)66}$ 27. $6\overline{)72}$

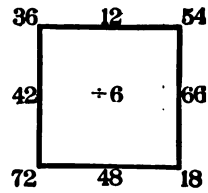
Give many other problems in division by 4, 5, and 6.

REVIEW

67. Oral.







1. $12 \div 4 =$ $15 \div 3 =$ $24 \div 6 =$ $10 \div 2 =$

2. $20 \div 5 =$ $16 \div 4 =$ $18 \div 2 =$ $28 \div 4 =$

3. $14 \div 2 =$ $30 \div 6 =$ $30 \div 3 =$ $25 \div 5 =$

4. $60 \div 6 =$ $50 \div 5 =$ $40 \div 4 =$ $20 \div 2 =$

5. $18 \div 6 =$ $21 \div 3 =$ $24 \div 4 =$ $36 \div 6 =$

6. A workman earned 25 pesos in 5 days. How much did he earn in 1 day?

7. Mr. Cid traveled 48 kilometers in 4 days. How far did he travel each day?

8. What is $\frac{1}{5}$ of 25? Of 40? Of 55? Of 60?

9. What is $\frac{1}{6}$ of 30? Of 48? Of 72? Of 36?

10. Juana gave 18 roses to her friends. Each friend got 3 roses. To how many friends did she give them?

11. Luis takes 48 chicos to market and sells $\frac{1}{4}$ of them. How many chicos does he sell?

MULTIPLICATION AND DIVISION

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

In this table, the product of any left-hand number and top number is opposite the first and under the second. Thus, $3 \times 4 = 12$, 12 is opposite 3 and under 4. Reading across the rows gives practice in counting by the different numbers from 1 to 12. The pupils are expected to formulate the multiplication tables from this table after it has been explained by the teacher.

68. Oral.

1. Make the table of 7's and learn it.

2. Seven squares have how many corners?

3. If 1 chair costs 3 pesos, 7 chairs will cost . . . pesos.

4. How many chupas are there in 7 gantas?

5.	$7\times 2=$	$7\times 3=$	$7\times 4=$	$7\times 5=$
6.	$3\times 8=$	$5\times 7=$	$6\times 7=$	$4\times 7=$
7.	$7\times 8=$	$8\times 6=$	$7\times 9=$	$8\times 7=$
8.	$4\times 12=$	$10\times 7=$	$9\times 3=$	$5\times 11=$
9.	$7\times 10=$	$7\times 11=$	$7\times 12=$	$12\times 7=$

69. Oral.

1. How many 7's are there in 14? In 21?

2. $7\overline{)35}$ 3. $7\overline{)42}$ 4. $7\overline{)49}$ 5. $7\overline{)70}$ 6. $7\overline{)77}$

7. Seven equal jars are filled with 63 gantas of water. Each jar holds how many gantas?

8. In 1 ganta there are 3 liters. In 7 gantas there are how many liters?

9. Alipio gave 7 centavos each for 7 melons. How much did they all cost?

10. There are 35 chupas of milk in a jar. How many times can I dip out 7 chupas?

11. Seven triangles have how many sides?

12. $7\div 7=$ $56\div 7=$ $63\div 7=$ $84\div 7=$

13. One seventh of 14 meters is how many meters?

14. Twenty-eight days are how many weeks?

15. What is $\frac{1}{7}$ of 21? Of 49? Of 77?

16. How many decimeters in 7 meters?

70. Oral.

1. Make the table of 8's and learn it.

2. Draw a line 2 centimeters long. Draw another line 8 times as long. How long is the second line?

3. Carmen planted 8 rows of seeds, putting 6 seeds in each row. How many seeds did she plant?

4. $8\times 4=$ $3\times 8=$ $8\times 3=$ $8\times 2=$

5. $5\times 8=$ $8\times 5=$ $6\times 8=$ $8\times 6=$

6. $8\times 7=$ $6\times 9=$ $8\times 8=$ $7\times 4=$

7. $9\times 3=$ $8\times 9=$ $4\times 10=$ $8\times 10=$

8. $3\times 11=$ $8\times 11=$ $8\times 12=$ $12\times 8=$

71. Oral.

1. What is $\frac{1}{8}$ of 8? Of 16? Of 80? Of 48?

2. $8\overline{)40}$ 3. $8\overline{)32}$ 4. $8\overline{)56}$ 5. $8\overline{)64}$ 6. $8\overline{)72}$

7. If 1 dress costs 8 pesos, how many dresses can I buy with 40 pesos?

8. Forty-eight desks are placed in 8 equal rows. How many desks in each row?

9. I have 8 baskets holding 4 liters each. How many liters of rice will fill them all?

10. $48\div 8=$ $88\div 8=$ $96\div 8=$ $80\div 8=$

72. Oral.

1. Make the table of 9's and learn it.

2. In 9 weeks there are how many days?

3. Nine decimeters equal . . . centimeters.

4. If you are in school 4 hours in one day, how many hours will you be in school in 9 days?

5.	$9\times1=$	$9\times3=$	$9\times\ 5=$	$9\times\ 7=$
6.	$1\times9=$	$3\times9=$	$5\times\ 8=$	$7\times\ 6=$
7.	$9\times6=$	$9\times8=$	$9\times10=$	$9\times\ 4=$
8.	$9\times9=$	$2\times9=$	$5\times\ 9=$	$9\times11=$
9.	$12\times7=$	$10\times6=$	$8\times\ 9=$	$8\times12=$

73. Oral.

1. How many 9's are there in 18? In 36?

2. $9\overline{)27}$ 3. $9\overline{)63}$ 4. $9\overline{)72}$ 5. $9\overline{)90}$ 6. $9\overline{)99}$

7. A farmer makes 45 hektars of land into 9 equal rice fields. How many hektars are in each field?

8. What will 9 boxes of candy cost at 10 centavos a box?

9. I paid 72 centavos for 9 yards of lace. What did 1 yard cost?

10. $45\div9=$ $9\div9=$ $81\div9=$ $54\div9=$

REVIEW OF MULTIPLICATION AND DIVISION

74. Oral.

1. Count by 5's to 100. Count by 10's to 100.
2. How many 5's are there in 50, 30, 55, 60?
3. Give the tables of 6's and 7's.
4. How many 6's are there in 12, 30, 42, 60?
5. How many 7's are there in 21, 35, 49, 63?
6. How many 10's are there in 40, 70, 80, 20?
7. Count by 8's to 96. Count by 9's to 99.
8. How many 8's are there in 24, 40, 72, 88?
9. How many 9's are there in 18, 36, 63, 81?

10.	$2 \times 9 =$	$\frac{1}{4}$ of $16 =$	$7 \times 7 =$	$40 \div 4 =$
11.	$\frac{1}{2}$ of $6 =$	$6 \times 5 =$	$50 \div 5 =$	$8 \times 7 =$
12.	$3 \times 8 =$	$36 \div 4 =$	$3 \times 12 =$	$\frac{1}{3}$ of $27 =$
13.	$4 \div 2 =$	$7 \times 12 =$	$2 \times 10 =$	$15 \div 5 =$
14.	$7 \times 5 =$	$8 \times 3 =$	$8 \times 8 =$	$\frac{1}{6}$ of $72 =$
15.	$30 \div 6 =$	$\frac{1}{3}$ of $12 =$	$9 \times 4 =$	$6 \times 11 =$
16.	$9 \times 9 =$	$6 \times 6 =$	$42 \div 7 =$	$\frac{1}{2}$ of $24 =$

17. In 36 chicos there are how many dozen?

18. Pablo earned 30 pesos in 6 weeks. How many pesos did he earn in 1 week?

19. If one pod holds 7 seeds, how many pods will hold 28 seeds?

PART III

NUMBERS TO 99,999

Reading and writing numbers; currency; time; addition; subtraction; multiplication; division; easy fractions; business reviews based on Philippine industries.

READING AND WRITING NUMBERS TO 99,999

1. Oral.

1. Ten figures are used in writing numbers.

They are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

The first is called *naught* or *zero.*

2. Ninety-nine and one are one hundred, written 100.

3. Count from one hundred to one hundred ten.

4. Count by 100's from 100 to 900.

Read: 200; 400; 600; 800; 300; 500; 700; 900.

2. Written.

One hundred one is written, 101.

Write in figures: one hundred two; one hundred three; one hundred four; one hundred five; one hundred six; one hundred seven; one hundred eight; one hundred nine.

3. Oral.

362 is read, three hundred sixty-two.
405 is read, four hundred five.

Read the following numbers:

1.	242	395	685	963	460
2.	406	822	117	784	901
3.	261	415	855	704	110
4.	638	390	629	500	444
5.	317	528	713	479	804
6.	965	617	510	666	575

7. Count from 100 to 150.

8. Count by 10's from 100 to 200.

9. Count by 10's from 500 to 600.

10. What is the largest number you can write with three figures?

4. Written.

1. Write all the numbers between 120 and 130.
2. Write the number that is one more than 200.
3. Write all the numbers between 240 and 260.
4. Write the number that is one more than 430.
5. Write the number that is one less than 300.

Give other exercises in reading and writing numbers consisting of three figures each.

Write in figures:

1. Thirty-eight.
2. One hundred six.
3. Four hundred eleven.
4. Five hundred sixty-one.
5. Nine hundred one.
6. One hundred twenty-two.
7. Seven hundred fifty-seven.
8. Six hundred forty-three.
9. Eight hundred seventy-five.
10. Three hundred two.
11. Two hundred ninety-nine.
12. Five hundred eighteen.

5. Oral.

When a number is written with three figures, the right-hand figure is the *units'* figure, the second is the *tens'* figure, and the third is the *hundreds'* figure.

Read the following numbers, and tell how many hundreds, tens, and units there are in each:

1.	213	467	740	839	691
2.	895	346	256	507	718

6. Oral.

1. Count by 100's from 100 to 900.

2. Ten hundred is called *one thousand*, written 1,000.

3. Count by 10's from 900 to 1,000.

Read the following numbers:

4. 2,000	4,000	6,000	8,000
5. 3,000	5,000	7,000	9,000

1,040 is read, one thousand forty.

2,316 is read, two thousand, three hundred sixteen.

Read the following numbers:

6. 1,300	2,540	1,244	5,555
7. 1,101	3,800	5,220	1,680
8. 7,700	6,898	7,004	4,008
9. 6,116	4,014	9,900	9,999

7. Written.

Write in figures:

1. Two thousand, four hundred twenty-one.
2. Six thousand, seventy-four.
3. One thousand, three hundred sixty-six.
4. Eight thousand, nine hundred eighty-two.

Dictate numbers of four figures. Let the pupils write them on the board.

8. Oral.

10,000 is read, ten thousand.

14,300 is read, fourteen thousand, three hundred.

Read the following numbers:

1.	552	1,867	945	2,500
2.	1,600	7,001	3,850	7,070
3.	5,945	8,343	11,500	12,383
4.	9,601	5,015	13,650	9,734
5.	89	19,000	25,866	32,541
6.	17,200	43,898	55,415	7,907
7.	64,380	75,001	36,018	6,075

9. Written.

Write in figures:

1. Four thousand, seven hundred one.
2. Seven thousand, forty-five.
3. Twelve thousand, eight hundred.
4. Fourteen thousand, ninety-six.
5. Twenty-one thousand, one hundred fourteen.
6. Eight hundred fifty-nine.
7. Forty thousand, six.
8. Sixty-six thousand, seven hundred.
9. Nineteen thousand, thirty-seven.

PHILIPPINE CURRENCY

10. Oral.

Copper coins: half-centavo, centavo.

Nickel coins: 5-centavo.

Silver coins: 10-centavo, 20-centavo, half-peso, peso.

2 half-centavos = 1 centavo.

100 centavos = 1 peso.

1. In a half-peso there are . . . centavos.
2. How many 10-centavo pieces equal one peso?
3. How many 20-centavo pieces equal one peso?

One peso is written, ₱ 1.

Three pesos and four centavos is written, ₱ 3.04.

4. *Read:* ₱ 3.50; ₱ .45; ₱ 12.50; ₱ 8.05; ₱ 25.10; ₱ 135.40; ₱ 210.38; ₱ 2,316.48; ₱ 3,115.86.

Give plenty of blackboard drill in the reading of pesos and centavos.

UNITED STATES CURRENCY

11. Oral.

Copper coins: 1-cent.
Nickel coin: 5-cent.
Silver coins: dime, quarter, half-dollar, dollar.

10 cents = 1 dime.

10 dimes = 1 dollar.

1. A quarter of a dollar equals . . . cents.

2. . . . nickels equal a quarter.

3. . . . quarters equal a dollar.

One dollar is written, $ 1.

One dollar and five cents is written, $1.05.

Four dollars and thirty-two cents is written, $ 4.32.

4. *Read:* $ 1.40; $ 3.81; $ .75; $ 8.16; $ 85.42; $ 13.60; $ 142.04; $ 3,251.61; $ 925.80; $ 1,005; $ 1,250.75.

12. Oral.

2 centavos = 1 cent.
2 pesos = 1 dollar.

1. For 5 cents you can get how many centavos?
2. One dime equals how many centavos?
3. Mr. Rosario took $ 10 to the bank to exchange for pesos. How many pesos did he get?
4. One peso is worth how many cents?
5. One dollar is worth how many centavos?
6. A merchant bought a hat for ₱ 3.50 and sold it for $ 2. How much did he gain?

13. Written.

Write:

1. 1 peso and 30 centavos.
2. 6 pesos and 15 centavos.
3. 38 pesos and 60 centavos.
4. 119 pesos and 7 centavos.
5. 5 dollars and 12 cents.
6. 94 dollars and 4 cents.
7. 100 dollars and 13 cents.
8. 318 dollars and 1 cent.
9. 400 dollars and 6 cents.

Give blackboard drill in writing pesos and centavos, dollars and cents.

BUYING AND SELLING

14. Oral.

1. Alfredo's mother has sent him to the store for 2 spools of thread costing 8 centavos each. He has a 20-centavo piece to pay for the thread. How much change should he receive?

2. Teofila buys 3 yards of sinamay at 20 centavos a yard, and 3 dozen buttons at 10 centavos a dozen. If she gives the clerk ₱1, how much change should she receive?

3. If I buy a hat for ₱2, and 8 handkerchiefs at 10 centavos each, what must I pay? How much less than ₱3 must I pay?

4. A merchant pays ₱.80 for a 20-yard bolt of ribbon, and sells it at 5 centavos a yard. How much does he gain on the bolt?

5. What is $\frac{1}{2}$ of ₱20? $\frac{1}{3}$ of ₱30? $\frac{1}{4}$ of ₱28?

6. Find the sum of ₱$1\frac{1}{2}$, ₱3, ₱$2\frac{1}{2}$, and ₱5.

ADDITION

15. Oral.

1. Addition is the process of uniting two or more like numbers.

2. The numbers united are called *addends.*

3. The result is called the *sum.*

In adding numbers containing pesos and centavos, write pesos under pesos, centavos under centavos.

Add:

4.	7	5.	3	6.	5	7.	6	8.	7	9.	9	10.	8
	4		8		9		6		6		4		7
11.	6	12.	5	13.	3	14.	2	15.	8	16.	9	17.	5
	9		7		6		10		6		8		10

18. I gave 10 cents for a ball and 7 cents for a box of candy. What did both cost?

19. At 12 centavos each, what will 3 slates cost?

16. Written.

Add:

1.	12	2.	25	3.	18	4.	72	5.	$43\frac{1}{2}$	6.	$64\frac{1}{3}$
	36		32		51		15		$44\frac{1}{2}$		$25\frac{1}{3}$

17. Oral.

Add:

1. 20	2. 60	3. 10	4. 70	5. 30	6. 90
40	90	80	20	40	10
7. 100	8. 300	9. 500	10. 200	11. 800	
200	400	200	700	100	
12. 1,000	13. 5,000	14. 2,000	15. 9,000		
3,000	4,000	6,000	1,000		

18. Written.

Add:

28
34
62

$8 + 4 = 12$. Write the 2 in units' place, and add the 1 ten to tens. $1 + 3 + 2 = 6$. The sum is 62.

1. 25	2. 19	3. 64	4. 46	5. 72	6. $58\frac{1}{4}$
46	31	17	18	$19\frac{1}{3}$	$23\frac{1}{4}$
7. 146	8. 612	9. 389	10. 735	11. 189	
213	86	401	126	205	
12. 413	13. 684	14. 122	15. 1,316	16. 2,804	
268	107	649	446	1,076	

Give supplementary drills in addition until the class can add rapidly and accurately.

19. Written.

Add:

587
175
762

5 + 7 = 12. Write the 2 in units' place, and add the 1 ten to tens. 1 + 7 + 8 = 16. Write the 6 in tens' place, and add the 1 hundred to hundreds. 1 + 1 + 5 = 7. The sum is 762.

1. 216 318	2. 456 380	3. 520 184	4. 473 269	5. 249 371
6. 132 269 314	7. 468 327 144	8. 920 75 84	9. 116 383 464	10. 385 423 109
11. ₱75.38 12.45	12. ₱17.52 13.81	13. ₱5.95 73.86	14. ₱123.16 85.91	
15. ₱1.93 25.84 13.70	16. ₱113.60 45.90 224.13	17. ₱88.25 118.00 76.83	18. ₱416.00 13.74 246.30	
19. 75 63 84 95	20. $16\frac{1}{3}$ 73 $25\frac{1}{3}$ 9	21. 42 55 17 26	22. 81 $9\frac{1}{4}$ $15\frac{1}{4}$ $64\frac{1}{4}$	23. 136 219 452 138

20. Oral.

1. Tomasa is 12 years old. How old will she be in 4 years?

2. If a schoolgirl reads 3 pages in her reader each day, how many pages does she read in 6 days?

3. Andres paid 4 centavos for a mango and had 14 centavos left. How much had he at first?

4. A boy has 2 dimes and 2 nickels. How much money has he?

21. Written.

Write in columns and add:

1. Two hundred forty; seventy-eight; one hundred sixty-six; four hundred five; sixteen.

2. Seventeen; six hundred forty-seven; eighty-nine; one thousand, one hundred twenty-six.

3. Two hundred thirty-eight; seven hundred; three hundred twenty; seventy-four; two hundred nineteen; four hundred eleven.

4. 427; 368; 1,145; 63.

5. 108; 2,755; 82; 3,680; 520.

6. 2,563; 814; 1,297; 4,009; 45.

22. Written.

1. A man earned ₱2.45 one week and ₱6.73 the next week. How much did he earn in two weeks?

2. There are 14 pupils in one class and 23 in another. How many pupils are in both classes?

3. Juan's father owns 27 hektars of land, and his uncle owns 33 hektars. How many hektars of land do they both own?

4. Josefa read two books. The first had 45 pages and the second had 56 pages. How many pages did Josefa read?

5. A farmer raised 24 cavanes of rice in one field and 26 in another. In both fields he raised ... cavanes.

6. What will 3 dozen tomatoes cost at 20 centavos a dozen?

Subtract:

7. 439 126	8. 582 272	9. 424 103	10. 813 613	11. 781 150
12. 267 132	13. 939 127	14. 560 430	15. 785 63	16. 149 43

23. Oral.

1. There are ... liters in one ganta. How many liters of water can I dip out of a 3-ganta jar full of water?

2. In $\frac{1}{2}$ of a ganta there are how many chupas?

3. There are ... gantas in 1 cavan. How many gantas are there in 2 cavanes?

4. Alfonso lives 120 meters from the schoolhouse. How many meters does he walk in going to school and returning?

5. Count by 4's:

0, 4, 8, etc., to 48. 1, 5, 9, etc., to 49.
2, 6, 10, etc., to 50. 3, 7, 11, etc., to 51.

6. Count by 5's:

0, 5, 10, etc., to 100. 1, 6, 11, etc., to 61.
2, 7, 12, etc., to 62. 3, 8, 13, etc., to 63.

24. Written.

Add:

1.	2.	3.	4.
2,164	144	4,120	7,360
943	5,638	984	842
3,216	109	1,632	1,046
813	75	2,300	373

WEAVING

25. Written.

1. Ana is weaving hats to take to the market. If she sells 2 hats at ₱ 1 each, and 3 hats at ₱ 2 each, how much will she get?

2. If she can weave 2 hats in one week, how long will it take her to weave a dozen hats?

3. Ana's brother weaves baskets to sell. What will he get for 5 large baskets at 40 centavos each, and 10 small baskets at 10 centavos each?

4. If he trades 3 baskets for 1 pot of rice, how many pots of rice can he get for 9 baskets?

5. If each of the large baskets holds 10 gantas, what will 7 of them hold?

6. If the small baskets hold 4 chupas each, how many small baskets will hold as much as one large basket?

SUBTRACTION

26. Oral.

1. Subtraction is the process of finding the difference between two like numbers.

2. The number from which we subtract is called the *minuend.*

3. The number subtracted is called the *subtrahend.*

4. The result is called the *difference.*

In subtracting numbers containing pesos and centavos, write pesos under pesos, centavos under centavos.

5. $8+\cdot=14$ $6+\cdot=11$ $7+\cdot=13$ $\frac{1}{4}+\cdot=\frac{2}{4}$

6. $9+\cdot=16$ $3+\cdot=13$ $4+\cdot=11$ $\frac{1}{3}+\cdot=\frac{2}{3}$

7. $8+\cdot=12$ $14+\cdot=18$ $17+\cdot=20$ $\frac{1}{2}+\cdot=\frac{2}{2}$

Subtract:

8.	9.	10.	11.	12.
60	80	300	900	700
20	40	100	400	200

13.	14.	15.	16.
800	5,000	9,000	7,000
600	3,000	3,000	4,000

17. Carlos bought a book for 40 centavos and sold it for 50 centavos. What did he gain?

27. Written.

Subtract:

1. 95	2. 74	3. 89	4. 85	5. 63	6. 58
33	24	36	34	31	16
7. 376	8. 893	9. 682	10. 466	11. 748	
214	572	152	234	508	

52
28
24

The pupil may say either:

(1) 8 from 12 leaves 4; 2 from 4 leaves 2. The difference is 24.

Or, (2) 8 and 4 are 12; 3 and 2 are 5. The difference is 24.

Do not confuse your pupils by attempting to teach both methods suggested here. Follow the method you adopted in Part II. See note on page 74. The pupil should be required to check results by adding the difference and subtrahend.

12. 91	13. 87	14. 70	15. 69	16. 52	17. 81
64	36	47	28	29	56
18. 171	19. 382	20. 476	21. 764	22. 940	
58	147	340	139	216	

28. Oral.

1.	12−7=	13−9=	16− 4=	20−10=
2.	17−8=	15−6=	18−10=	19− 7=
3.	20−4=	30−6=	36− 4=	21− 8=

4. From a bunch of 26 bananas in the market I buy 16. How many are left in the bunch?

5. José is standing by a 20-foot flag pole. If José is 5 feet tall, how far is it from the top of his head to the top of the flag pole?

6. A boy caught 19 fish in the forenoon and 6 in the afternoon. How many did he catch in all?

7. There are 17 boys belonging to a class, and 13 are present. How many are absent?

8. What will be the cost of a liter of milk if 3 liters cost 12 centavos?

29. Written.

Subtract:

413
135
278

The pupil may say either:

(1) 5 from 13 leaves 8; 3 from 10 leaves 7; 1 from 3 leaves 2. The difference is 278.

Or, (2) 5 and 8 are 13; 4 and 7 are 11; 2 and 2 are 4. The difference is 278.

1. 746 283	2. 915 254	3. 492 384	4. 562 389	5. 843 376
6. 456 190	7. 628 281	8. 950 227	9. 705 263	10. 961 249

11. 1,633 246	12. 2,192 1,205	13. 3,562 1,708	14. 1,609 436
15. 4,230 1,615	16. 9,400 2,147	17. 8,216 5,731	18. 7,655 1,926
19. 6,000 2,460	20. 4,781 2,364	21. 5,612 3,905	22. 2,890 1,906
23. ₱ 50.00 10.75	24. ₱ 37.16 26.39	25. ₱ 84.27 36.00	26. ₱ 73.92 52.94

27. A farmer had 53 piculs of sugar and sold 39 piculs. How many piculs were left?

28. Leon sold 73 chicos on Monday and 48 on Tuesday. How many chicos did he sell?

29. Pablo's book has 91 pages. If he has read 73 pages, how many more pages has he to read?

30. There were 78 hektoliters of water in a tank; 29 hektoliters ran out. How much water was left in the tank?

31. From ₱ 6.32 subtract ₱ 4.90.

32. From ₱ 19.40 subtract ₱ 7.65.

Give plenty of drill in abstract subtraction.

30. Written.

Subtract:

1. 8,372 1,257	2. 1,847 592	3. 6,740 2,275	4. 9,730 4,528
5. 6,875 4,738	6. 9,827 6,394	7. 8,302 7,695	8. 8,387 5,694
9. ₱25.87 1.92	10. ₱60.72 35.41	11. ₱53.60 24.54	12. ₱70.04 12.63

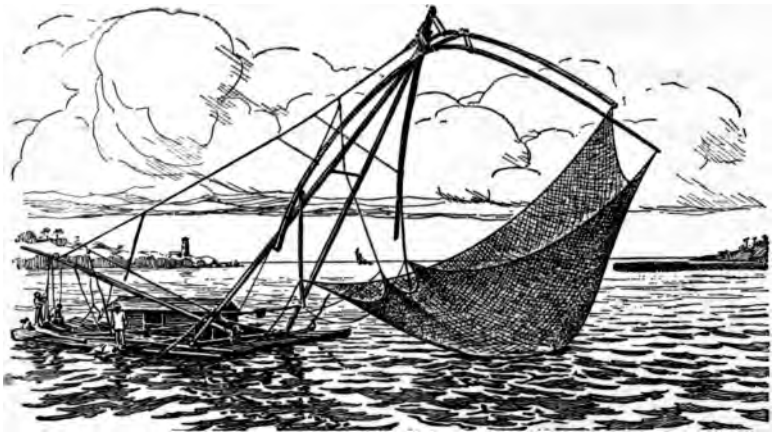
13. A man rode 74 miles in two days. If he rode 38 miles the first day, how far did he ride the second day?

14. There are 582 houses in a town; 175 of the houses are made of wood and the rest are made of nipa. How many nipa houses are there in the town?

15. Mr. Reyes paid ₱95 for one horse and ₱115 for another. What did he pay for both?

16. There are 100 liters in 1 hektoliter. How many liters are there in 6 hektoliters?

17. From ₱375 subtract ₱136.40.



FISHING

31. Oral.

1. If these men catch 40 pounds of fish in a day and sell half of them, how many pounds will they have left?

2. At 5 centavos a pound, what will they get for 20 pounds?

3. Candido took 45 fish to the market to sell. If he had 9 left, how many did he sell?

4. Ramona cooked 18 small fish and her father ate 11 of them. How many were left?

5. On one raft there are 3 men, on another 5, and on another 2. How many men are there on the three rafts?

REVIEW OF ADDITION AND SUBTRACTION

32. Oral.

1.	9+10=	13− 3=	28+ 6=	45− 8=
2.	70− 6=	39+ 7=	48− 8=	16−15=
3.	42− 5=	68+ 7=	95− 6=	57−52=
4.	88+10=	100−95=	83−79=	32+ 9=
5.	66−58=	47−41=	93−87=	79+ 9=
6.	39+ 7=	62−10=	74+ 8=	31− 9=

7. Count by 6's:
   0, 6, 12, etc., to 72. 1, 7, 13, etc., to 73.
   2, 8, 14, etc., to 74. 3, 9, 15, etc., to 75.

8. Count by 7's:
   0, 7, 14, etc., to 84. 1, 8, 15, etc., to 85.
   2, 9, 16, etc., to 86. 3, 10, 17, etc., to 87.

9. How many thirds are there in 2 lemons?

10. How many fourths are there in 3 circles?

33. Written.

Add:

1.	2.	3.	4.
118	106	85	2,952
95	3,255	286	170
1,236	2,188	7,137	9,218
787	8,357	56	795
2,222	2,314	1,248	4,121

5.	6.	7.	8.
₱ 29.16	₱ 110.04	₱ 23.67	₱ 106.38
30.84	43.26	38.41	19.42
116.33	419.24	19.88	8.67
294.87	17.32	148.60	288.30

Subtract:

9.	10.	11.	12.	13.
95	140	437	609	845
72	37	153	154	727

14.	15.	16.	17.
1,945	2,315	7,800	5,904
684	1,493	1,902	2,736

18.	19.	20.	21.
₱ 25.30	₱ 238.16	₱ 1,350.00	₱ 689.01
11.94	94.20	216.25	210.75

34. Oral.

1. There are 40 pupils in one room. If half of them are girls, how many boys are there?

2. A market woman had 32 oranges. She sold $\frac{1}{4}$ of them. How many oranges did she sell?

3. A girl has 30 centavos. How many more centavos must she get to have half a peso?

4. What will $3\frac{1}{2}$ pounds of 20-cent coffee cost?

5. $2\frac{1}{2}+2\frac{1}{2}=$ $3\frac{1}{3}+3\frac{1}{3}=$ $4\frac{1}{4}+4\frac{1}{4}=$

35. Written.

1. Mr. Dizon paid ₱2,346 for a house, ₱139 for a carromata, and ₱86 for a horse. What did they all cost?

2. A boy had 63 pictures. He gave away 17 of them. How many had he left?

3. Find the sum of the numbers beginning with 386 and ending with 390.

4. If the schoolhouse is 12 yards long, how many feet long is it?

5. Carmen is 15 years old, her mother is 37, and her father is 42. What is the sum of their ages?

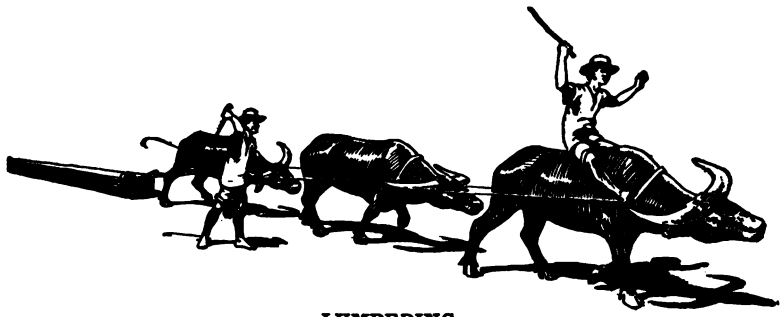
6. Conrado earned 95 centavos in one week. He paid 13 centavos for candy, and 40 centavos for a book. How much money had he left?

7. How many trees are there in an orchard which has 123 lemon trees and 284 orange trees?

8. A man earns ₱4.50 a week and spends ₱4.10. How much will he save in 2 weeks?

9. 2,750+384+1,700+3,925+6,004.

10. At ₱2 each, what will 14 telegraph poles cost?

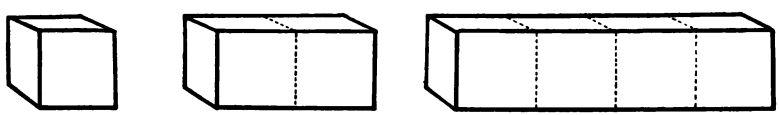


LUMBERING

36. Written.

1. A block of wood 1 foot long, 1 foot wide, and 1 foot thick, is called 1 cubic foot of wood. How many cubic feet of wood in a block 1 foot wide, 1 foot thick, and 3 feet long?

2. How many cubic feet are in each of these blocks, if the first block is 1 cubic foot?



3. The carabaos are bringing a log of narra from the forest to the river. It is 1 foot wide, 1 foot thick, and 10 feet long. How many cubic feet of wood are in the log?

4. At ₱.30 per cubic foot, what is the cost of cutting this log and hauling it to the river?

5. What will the log sell for at ₱2 per cubic foot?

MULTIPLICATION BY 2, 3, 4, AND 5

37. Oral.

1. What will a dozen lemons cost at 3 centavos each?

2. How many pencils are there in 5 dozen?

3. If two oranges sell for 5 centavos, what must I pay for 8 oranges?

4. How many chupas are there in 9 gantas?

5. How much silk, worth a peso a yard, can be bought for 25 centavos?

6. A man gave 5 boys 10 centavos each, and had 10 centavos left. How much had he at first?

7. Francisco has 30 centavos and Nicholas has twice as much. How much have both boys?

8.	$2 \times 20 =$	$20 \times 2 =$	$4 \times 7 =$	$9 \times 4 =$
9.	$30 \times 2 =$	$4 \times 20 =$	$6 \times 10 =$	$12 \times 3 =$
10.	$2 \times 40 =$	$20 \times 4 =$	$2 \times 30 =$	$40 \times 2 =$
11.	$20 \times 3 =$	$30 \times 3 =$	$11 \times 8 =$	$7 \times 12 =$
12.	$3 \times 20 =$	$9 \times 6 =$	$3 \times 30 =$	$6 \times 12 =$
13.	$\frac{1}{2}$ of $40 =$	$\frac{1}{2}$ of $60 =$	$1\frac{1}{2} \times 2 =$	$2\frac{1}{3} \times 6 =$
14.	$\frac{1}{3}$ of $15 =$	$\frac{1}{3}$ of $60 =$	$2\frac{1}{2} \times 4 =$	$3\frac{1}{3} \times 9 =$
15.	$\frac{1}{4}$ of $12 =$	$\frac{1}{4}$ of $20 =$	$3 \times 1\frac{1}{3} =$	$2\frac{1}{4} \times 4 =$

Review the multiplication tables before beginning this lesson.

38. Oral.

1. Multiplication is the process of taking one number as many times as there are units in another number.

2. The number multiplied is called the *multiplicand.*

3. The number by which we multiply is called the *multiplier.*

4. The result is called the *product.*

Multiply numbers containing pesos and centavos like other numbers, placing a period after the pesos in the product.

39. Written.

Multiply:

1. 43 × 2	2. 13 × 3	3. 22 × $3\frac{1}{2}$	4. 21 × 4	5. 30 × $3\frac{1}{3}$	6. 23 × 2
7. 144 × 2	8. 431 × 2	9. 203 × 3	10. 2,122 × 4	11. 123 × 3	
12. ₱ 2.01 × 4	13. ₱ 14.03 × 2	14. ₱ 32.11 × 3	15. ₱ 24.23 × 2		
16. ₱ 12.20 × 4	17. ₱ 33.12 × 3	18. ₱ 44.32 × 2	19. ₱ 11.10 × 5		

40. Written.

Multiply:

$$\begin{array}{r} 37 \\ 2 \\ \hline 74 \end{array}$$

2 times 7 are 14. Write the 4 in units' place. 2 times 3 tens are 6 tens. 6 tens and 1 ten are 7 tens. Write the 7 in tens' place. The product is 74.

1. $\begin{array}{r} 45 \\ 2 \\ \hline \end{array}$	2. $\begin{array}{r} 17 \\ 2 \\ \hline \end{array}$	3. $\begin{array}{r} 28 \\ 2 \\ \hline \end{array}$	4. $\begin{array}{r} 19 \\ 2 \\ \hline \end{array}$	5. $\begin{array}{r} 36 \\ 2 \\ \hline \end{array}$	6. $\begin{array}{r} 48 \\ 2 \\ \hline \end{array}$
7. $\begin{array}{r} 16 \\ 3 \\ \hline \end{array}$	8. $\begin{array}{r} 27 \\ 3 \\ \hline \end{array}$	9. $\begin{array}{r} 34 \\ 3 \\ \hline \end{array}$	10. $\begin{array}{r} 19 \\ 3 \\ \hline \end{array}$	11. $\begin{array}{r} 26 \\ 3 \\ \hline \end{array}$	12. $\begin{array}{r} 17 \\ 3 \\ \hline \end{array}$

13. 2×46	18. 4×24	23. 4×45
14. 3×29	19. 4×16	24. $5\frac{1}{3} \times 18$
15. 2×75	20. 4×33	25. $5\frac{1}{2} \times 24$
16. 3×61	21. 3×82	26. $4\frac{1}{3} \times 66$
17. 2×47	22. 3×65	27. $5\frac{1}{4} \times 32$

41. Oral.

1. How many wings have 8 birds?
2. What will 4 slates cost at 10 centavos each?

Make problems for the following examples:

3. 3×5	5. 2×20	7. $2 \times \frac{1}{3}$
4. 4×2	6. 3×30	8. $3 \times \frac{1}{4}$

42. Written.

Multiply:

1. 128 × 2	2. 216 × 3	3. 118 × 3	4. 207 × 4	5. 339 × 2
6. 328 × 2	7. 117 × 4	8. 205 × 3	9. 149 × 2	10. 109 × 4
11. 216 × 2	12. 128 × 3	13. 214 × 4	14. 439 × 2	15. 217 × 4

284 × 3 = 852

3 times 4 are 12. Write the 2 in units' place. 3 times 8 tens are 24 tens. 24 tens and 1 ten are 25 tens. Write the 5 in tens' place. 3 times 2 hundreds are 6 hundreds. 6 hundreds and 2 hundreds are 8 hundreds. Write the 8 in hundreds' place. The product is 852.

16. 145 × 2	17. 454 × 2	18. 176 × 3	19. 378 × 2	20. 508 × 3
21. 718 × 2	22. 589 × 3	23. 493 × 3	24. 927 × 2	25. 843 × 3
26. 318 × 4	27. 245 × 4	28. 653 × 4	29. 240 × 5	30. 218 × 5
31. ₱ 2.64 × 5	32. ₱ 3.73 × 5	33. ₱ 8.14 × 5	34. ₱ 7.84 × 5	

HEMP INDUSTRY

43. Written.

Manila hemp is the best in the world. In the picture you can see the bales of hemp lying on the wharf, ready to be put on the ship.

1. Each bale weighs 125 kilos. If 8 bales weigh 1 ton, how many kilos are there in 1 ton?

2. This hemp was sent to Manila by Mr. Santos of Legaspi. At ₱260 per ton, what did Mr. Santos get for 5 tons of hemp?

3. At ₱8 per hektar, what will it cost Mr. Santos to have his farm of 16 hektars cleaned?

4. How many kilos of fiber can a man prepare in 6 weeks, if he prepares 30 kilos a week?

MULTIPLICATION BY 6, 7, 8, AND 9

44. Oral.

Give products:

1. 2×30	6. 4×22	11. 5×200
2. 2×22	7. 4×200	12. 5×80
3. 3×11	8. 2×400	13. 4×50
4. 3×33	9. 3×300	14. 6×20
5. 3×200	10. 2×120	15. 6×40

16. Count by 8's:
0, 8, 16, etc., to 96. 1, 9, 17, etc., to 97.

45. Written

Find products:

1. 5×168	8. 7×323	15. 8×427
2. 5×239	9. 7×416	16. 9×316
3. 5×684	10. 7×834	17. 9×126
4. 6×137	11. 6×987	18. 9×324
5. 6×250	12. 7×521	19. 9×672
6. 6×732	13. 8×314	20. 8×983
7. 6×581	14. 8×250	21. 7×657

Make problems for the following examples:

22. 6×25	24. 9×42	26. $2 \times 3\frac{1}{2}$
23. 7×24	25. 8×35	27. $3 \times 4\frac{1}{3}$

46. Written.

1. $3 \times 4{,}683 =$
2. $5 \times 1{,}240 =$
3. $6 \times 7{,}384 =$
4. $6 \times 4{,}794 =$
5. $7 \times 3{,}801 =$
6. $8 \times 1{,}527 =$
7. $9 \times 1{,}386 =$
8. $9 \times 5{,}606 =$
9. $8 \times 7{,}392 =$
10. $4 \times ₱ 9.77 =$
11. $5 \times ₱ 38.84 =$
12. $7 \times ₱ 46.25 =$
13. $8 \times ₱ 31.94 =$
14. $9 \times ₱ 25.67 =$
15. $9 \times ₱ 83.15 =$

16. In one cavan there are 75 liters. In 5 cavanes there are how many liters?

17. If Miss Barros teaches 7 months for ₱ 35 a month, how much does she earn?

18. In one school there are 164 pupils. In another school there are 6 times as many. How many pupils are in the second school?

19. There are 1,000 meters in 1 kilometer. How many meters are there in 12 kilometers?

20. At ₱ 2.35 each, what will 7 chairs cost?

21. If one family eat 250 pounds of rice in 1 month, how much will they eat in 5 months?

22. A farmer bought 10 cows for $ 500. He sold them for $ 60 apiece. What did he gain?

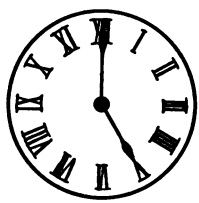
23. Find the distance around a field $10\frac{1}{2}$ meters square.

TIME

47. Oral.

1	2	3	4	5	6
I	II	III	IIII	V	VI
7	8	9	10	11	12
VII	VIII	IX	X	XI	XII

The Roman numerals are made of letters. They are used on the clock face. The long hand is the minute hand. The short hand is the hour hand. The minute hand goes twelve times around the dial while the hour hand goes once around.



Tell the time when the minute hand points to XII and the hour hand to III; to V; to X; to VII; to I; to XI; to IIII.

What time is shown on each clock face below?

Teach the pupils how to express the time before and after the even hours. Draw a clock face on the blackboard, and have the pupils draw the hands in position to tell the time you suggest. Drill until they can tell the time quickly with the hands in any position.

48. Oral.

1. What time is it now by the clock?

2. How many minutes does it take the minute hand to go once around the dial?

3. Name the days of the week. What day is this?

4. Name the months of the year. What month is this?

49. Written.

60 seconds = 1 minute.
60 minutes = 1 hour.
24 hours = 1 day.
365 days = 1 year.

1. How many seconds are there in 4 minutes?

2. How many minutes are there in 5 hours?

3. How many hours are there in 1 week?

4. How many days are there in 2 years?

5. How many hours do you spend in school every day? How many minutes is this?

6. How many hours do you spend in school every week?

7. How many minutes are there in half an hour? In a quarter of an hour? In $2\frac{1}{2}$ hours?

SUGAR INDUSTRY

50. Written.

1. Mr. Bantug has 8 hektars of land near Iloilo planted in sugar cane. If it yields 75 piculs to the hektar, how much sugar will he have?

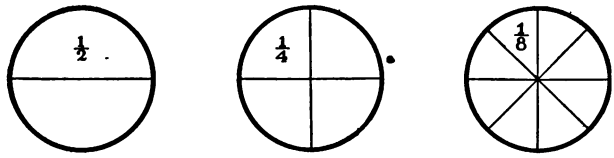
2. If he sells one half of his sugar, how many piculs will he have left?

3. What will he get for 6 piculs of sugar at ₱ 4.50 per picul?

4. At 25 centavos per picul, what will it cost him to send 9 piculs of sugar to Iloilo?

5. If it costs Mr. Bantug ₱ 1,000 per hektar to produce the sugar, and he sells his crop for ₱ 1,800, what is his gain?

HALVES, FOURTHS, AND EIGHTHS

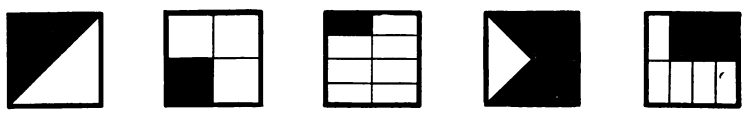


51. Oral.

1. How many halves are there in a circle? How many fourths? How many eighths?

2. Draw three squares. Divide one into halves, one into fourths, and one into eighths.

3. What part of each of these squares is shaded?



4. How many halves are there in one? How many fourths? How many eighths?

5. How many halves, fourths, and eighths are there in 1? in 3? in 6? in 9? in 10?

6. How many halves are there in 2 mangos?

7. How many fourths are there in 3 squares?

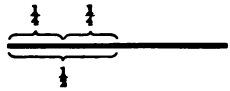
8. How many eighths are there in 4 chicos?

9. Conrado gives $\frac{1}{2}$ of a banana to each of 6 boys. How many bananas does he give away?

Give each part of problem 5 to a different pupil.

52. Written.

$\frac{1}{2} = \frac{2}{4}$



1. Draw lines and divide them into parts, like those above, to show the following:

$\frac{2}{2} = \frac{4}{4}$ $\quad \frac{1}{2} = \frac{4}{8}$ $\quad \frac{1}{2} + \frac{1}{2} = 1$ $\quad \frac{1}{2}$ of $\frac{1}{2} = \frac{1}{4}$

$\frac{1}{4} = \frac{2}{8}$ $\quad \frac{3}{4} = \frac{6}{8}$ $\quad \frac{1}{2}$ of $\frac{1}{4} = \frac{1}{8}$ $\quad \frac{1}{2}$ of $\frac{1}{4} = \frac{1}{4}$ of $\frac{1}{2}$

2. $\frac{4}{4}$ = how many ones? $\quad \frac{12}{4}$ = how many ones?

3. $\frac{16}{8}$ = how many ones? $\quad \frac{16}{4}$ = how many ones?

4. There are 8 boys in a class. Each boy has $\frac{1}{4}$ of a dollar. All the boys have . . . dollars.

5. $\frac{1}{2} + \frac{1}{2} = \frac{?}{2}$ $\quad \frac{1}{2} + \frac{1}{4} + \frac{1}{4} = \frac{?}{4}$ $\quad \frac{1}{2} + \frac{1}{8} = \frac{?}{8}$

6. $\frac{1}{2} + \frac{1}{4} = \frac{?}{4}$ $\quad \frac{1}{2} + \frac{2}{4} = \frac{?}{4}$ $\quad \frac{1}{4} + \frac{1}{8} = \frac{?}{8}$

7. $\frac{2}{4} - \frac{1}{4} = \frac{?}{4}$ $\quad \frac{3}{8} - \frac{1}{8} = \frac{?}{8}$ $\quad \frac{3}{2} - \frac{2}{2} = \frac{?}{2}$

8. $\frac{3}{4} - \frac{1}{4} = \ldots$ $\quad \frac{7}{8} - \frac{6}{8} = \ldots$ $\quad \frac{4}{4} - \frac{3}{4} = \ldots$

9. Juan earned ₱$\frac{1}{2}$ and Manuel earned ₱$\frac{1}{4}$. What part of a peso did both earn?

10. Castro has 20 eggs in a basket. He puts $\frac{1}{4}$ of them into a pan. How many eggs are in the pan?

11. Find $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ of each of the following numbers:

24, 32, 40, 16, 56, 72, 96, 128, 200, 240.

DIVISION

53. Oral.

1. Division is the process of finding how many times one number is contained in another.

2. The number divided is called the *dividend.*

3. The number by which we divide is called the *divisor.*

4. The result is called the *quotient.*

Divide numbers containing pesos and centavos like other numbers, placing a period after the pesos in the quotient.

Give quotients:

5. $2\overline{)24}$	8. $3\overline{)63}$	11. $5\overline{)35}$	14. $6\overline{)54}$
6. $3\overline{)21}$	9. $4\overline{)28}$	12. $6\overline{)60}$	15. $5\overline{)55}$
7. $4\overline{)44}$	10. $7\overline{)49}$	13. $7\overline{)63}$	16. $2\overline{)48}$

15 contains 2, 7 times, with 1 remainder.
26 contains 4, 6 times, with 2 remainder.

Give quotients and remainders in the following:

17. $17 \div 2$	19. $19 \div 3$	21. $33 \div 6$	23. $38 \div 7$
18. $21 \div 2$	20. $27 \div 5$	22. $41 \div 5$	24. $20 \div 9$

54. Written.

1. $\frac{1}{2}$ of $260 =$	3. $\frac{1}{3}$ of $630 =$	5. $\frac{1}{4}$ of $408 =$
2. $\frac{1}{2}$ of $424 =$	4. $\frac{1}{3}$ of $396 =$	6. $\frac{1}{4}$ of $844 =$

55. Written.

$2\overline{)52}$ 2 is contained in 5, 2 times, with 1 remainder.
26 2 is contained in 12, 6 times. The quotient is 26.

Before assigning this lesson, the teacher should place several examples on the blackboard and solve them before the class.

1. $38 \div 2 =$
2. $56 \div 2 =$
3. $72 \div 2 =$
4. $94 \div 2 =$
5. $45 \div 3 =$
6. $54 \div 3 =$
7. $78 \div 3 =$
8. $81 \div 3 =$
9. $72 \div 4 =$
10. $92 \div 4 =$
11. $75 \div 5 =$
12. $56 \div 4 =$
13. $96 \div 4 =$
14. $87 \div 3 =$
15. $95 \div 5 =$
16. $65 \div 5 =$
17. $75 \div 3 =$
18. $36 \div 2 =$
19. $84 \div 6 =$
20. $96 \div 6 =$
21. $91 \div 7 =$
22. $72 \div 3 =$
23. $76 \div 4 =$
24. $57 \div 3 =$

56. Oral.

1. If 6 cakes cost 24 centavos, what is the cost of one?

2. How many hours are there in $\frac{1}{4}$ of a day?

3. At 3 centavos a pound, how much must you pay for 10 pounds of salt?

4. If I have 50 centavos, to how many boys can I give 5 centavos each?

5. Count by 9's to 108.

57. Written.

$3\overline{)501}\ 167$

3 is contained in 5, 1 time, with 2 remainder.
3 is contained in 20, 6 times, with 2 remainder.
3 is contained in 21, 7 times. The quotient is 167.

1. $729 \div 3 =$
2. $417 \div 3 =$
3. $824 \div 4 =$
4. $568 \div 4 =$
5. $976 \div 4 =$
6. $725 \div 5 =$
7. $830 \div 5 =$
8. $415 \div 5 =$
9. $936 \div 6 =$
10. $840 \div 6 =$
11. $384 \div 6 =$
12. $910 \div 7 =$
13. ₱8.47 ÷ 7 =
14. ₱9.38 ÷ 7 =
15. ₱9.84 ÷ 8 =
16. ₱8.64 ÷ 8 =
17. ₱9.36 ÷ 9 =
18. ₱8.19 ÷ 9 =

19. If you place 90 nuts in 6 equal piles, how many nuts will be in each pile?

20. If 5 yards of sinamay cost 95 centavos, what is the cost of 1 yard?

21. How many centavos are there in $\frac{1}{5}$ of a peso?

22. At 5 centavos apiece, what must I pay for 14 tops?

23. It is 125 kilometers from Manila to Tarlac. If a train runs from Manila to Tarlac in 5 hours, how far does it run in 1 hour?

24. One hundred eight plants are set out in 9 equal rows. How many plants are in each row?

58. Oral.

1. $40 \div 2 =$	6. $60 \div 3 =$	11. $600 \div 200 =$
2. $60 \div 30 =$	7. $80 \div 40 =$	12. $900 \div 300 =$
3. $90 \div 3 =$	8. $80 \div 2 =$	13. $1200 \div 400 =$
4. $80 \div 20 =$	9. $60 \div 2 =$	14. $800 \div 200 =$
5. $90 \div 30 =$	10. $40 \div 20 =$	15. $1000 \div 500 =$

59. Written.

1. Alberto sells lansones for 8 centavos a dozen. How many dozen must he sell to get 2 pesos?

2. If each boat carries 7 cavanes of rice, how many boats will carry 126 cavanes?

3. Justo reads 4 books, each having 96 pages. How many pages does he read?

4. At 9 centavos a yard, how many yards of ribbon can I buy with ₱1.80?

Find quotients:

5. $3{,}560 \div 5$	11. $₱36.20 \div 4$	17. $8{,}692 \div 6$
6. $7{,}389 \div 3$	12. $₱98.76 \div 6$	18. $5{,}872 \div 8$
7. $6{,}186 \div 6$	13. $₱46.91 \div 3$	19. $2{,}745 \div 9$
8. $1{,}448 \div 8$	14. $₱72.15 \div 5$	20. $7{,}861 \div 7$
9. $2{,}536 \div 4$	15. $₱85.50 \div 9$	21. $1{,}840 \div 8$
10. $7{,}217 \div 7$	16. $₱54.30 \div 5$	22. $1{,}917 \div 9$

COCOANUT INDUSTRY

60. Written.

1. These cocoanuts came from a grove near Los Banos. The grove covers 3 hektars of land, and there are 450 trees to the hektar. How many trees are in the grove?

2. If 540 cocoanuts grew on 6 trees, what was the average number for 1 tree?

3. How much will 2,700 cocoanuts sell for on the tree at a peso a hundred?

4. If 4,635 cocoanuts were sent to Manila on 3 bamboo rafts, how many were on each raft?

5. At ₱7 per picul, what did the owner receive for 125 piculs of copra?

6. If 1,250 cocoanuts make 5 piculs of copra, how many cocoanuts will make 1 picul of copra?

7. If one horse can carry 200 pounds of copra, how many pounds can 9 horses carry?

8. If a man can gather 2,500 cocoanuts in one day, how many can he gather in 7 days?

REVIEW

61. Written.

Find sums:

1. $27+138+55+379+649$
2. $254+498+316+80+1{,}288$
3. $1{,}209+56+482+737+292$
4. $3{,}416+7{,}832+497+1{,}084$
5. $₱25.67+₱315+₱163.45+₱487.90$
6. $₱16.24+₱105.03+₱684+₱1{,}025.10$

Find differences:

7. $924-316$
8. $1{,}415-773$
9. $940-197$
10. $1{,}040-732$
11. $915-826$
12. $3{,}504-1{,}723$

Find products:

13. 3×284
14. 6×197
15. $5\times ₱3.45$
16. $4\times ₱12.09$
17. $8\times 1{,}636$
18. $9\times 1{,}478$

Find quotients:

19. $903\div 7$
20. $4{,}328\div 8$
21. $₱19.38\div 6$
22. $₱35.42\div 7$
23. $2{,}880\div 9$
24. $4{,}685\div 5$
25. $9{,}572\div 4$
26. $₱82.68\div 6$

62. Written.

1. Teresa bought 4 yards of jusi at 45 centavos a yard. How much did she pay?

2. If 6 dozen eggs cost ₱1.80, what is the cost of 1 dozen?

3. How many hours are there in 7 days?

4. A man walked 15 kilometers each day for 9 days. How far did he walk?

5. Mr. Silva has 3 farms. In the first there are 63 hektars, in the second 100 hektars, and in the third 45 hektars. In all the farms there are how many hektars?

6. If a man earns ₱55 a month, how much does he earn in one half of a year?

7. If you have a stick 1 yard long, how many sticks 1 inch long can you make of it?

8. How many seconds are there in 8 minutes?

9. Juana has 36 centavos, Paz has 84 centavos, and Pedro has one half as many as both of the girls. How many centavos has Pedro?

10. What will 6 tons of hemp sell for at ₱255 a ton?

11. In 8 cavanes there are how many gantas?

MULTIPLIERS ENDING IN 0

63. Oral.

To multiply by 10, add one cipher to the multiplicand; by 100, add two ciphers; by 1,000, add three ciphers, etc.

$10 \times 7 = 70$ $\quad 100 \times 4 = 400$ $\quad 1{,}000 \times 6 = 6{,}000$

Give products:

1. 10×8	4. $1{,}000 \times 5$	7. $1{,}000 \times 8$
2. 100×9	5. 100×46	8. 10×516
3. 10×34	6. 100×19	9. 10×140

64. Written.

When the multiplier consists of any number ending in ciphers, multiply as follows:

231	28	15
20	300	5,000
4,620	8,400	75,000

Find products:

1. 30×54	6. 400×45	11. $3{,}000 \times 26$
2. 500×12	7. 300×94	12. $5{,}000 \times 18$
3. 40×89	8. $2{,}000 \times 32$	13. 900×58
4. 20×167	9. 700×49	14. 600×104
5. 60×138	10. 800×64	15. 700×95

Give oral drill in multiplying by 10, 100, and 1,000.

MULTIPLIERS OF TWO FIGURES

65. Written.

Find products:

32
13
96
32
416

Write the multiplier under the multiplicand, units under units, tens under tens. Multiply first by the units' figure. $3 \times 32 = 96$. Place the right-hand figure of this partial product under the 3 of the multiplier.

Multiply next by the tens' figure. $1 \times 32 = 32$. Place the right-hand figure of this partial product under the 1 of the multiplier. Add the partial products.

Before assigning this lesson, the teacher should place several examples on the blackboard and solve them before the class, taking care to place the right-hand figure of each partial product under the figure of the multiplier used to obtain it.

42	123	318	449
14	24	43	19
168	492	954	4041
42	246	1272	449
588	2,952	13,674	8,531

1. 13×24
2. 16×31
3. 22×43
4. 14×56
5. 24×67
6. 34×51
7. 42×38
8. 17×64
9. 25×84
10. 36×75
11. 46×88
12. 62×93
13. 15×123
14. 23×218
15. 36×320
16. 63×145
17. 65×234
18. 72×507
19. 58×694
20. 47×925
21. 86×714

RICE INDUSTRY

66. Written.

1. At ₱2.75 a cavan, what did Mr. Rosario pay for 12 cavanes of rice to plant his farm?

2. It took 2 men 8 days to plant it. If each man received ₱.40 a day, what did it cost to get the rice planted?

3. When the rice was harvested, Mr. Rosario found he had 500 cavanes. At 25 centavos per cavan, what did he pay for hulling it?

4. He sold 15 piculs at ₱5 per picul, and 5 piculs at ₱3 per picul. What did Mr. Rosario get for the rice?

5. At 15 centavos per picul, what did it cost to have 20 piculs hauled to Batangas?

6. At 63 centavos per picul, what is the duty on 75 piculs of rice brought from China?

Let the pupils make problems about the pictures.

MULTIPLIERS OF THREE FIGURES

67. Oral.

1. A man has 2 piles of stones, each containing 300. How many stones has he?

2. At 40 cents each, what will 5 books cost?

3. There are 100 cattes in 1 picul. How many cattes are there in 25 piculs?

4. At ₱10 a picul, what will 32 piculs of sugar sell for?

5. If 3 baskets cost 30 centavos, what will 2 baskets cost?

68. Written.

Find products:

234	184	503
125	405	168
1170	920	4024
468	736	3018
234	74,520	503
29,250		84,504

1. 118×236
2. 133×339
3. 215×174
4. 167×406
5. 107×328
6. $16 \times 1{,}462$
7. $32 \times 2{,}081$
8. $47 \times 1{,}004$
9. 62×987
10. 104×266
11. $38 \times 1{,}241$
12. $55 \times 1{,}377$
13. $46 \times 1{,}472$
14. $29 \times 3{,}415$
15. $61 \times 1{,}648$

69. Written.

1. A clerk was paid ₱65 a month. What was his pay for one year?

2. A man earns ₱15 a week, and his son earns ₱6.50. What do they both earn in 11 weeks?

3. At ₱2 apiece, how many lamps will ₱36 buy?

4. If a boy sleeps 8 hours each night, how many hours does he sleep in 6 weeks?

5. What must I pay for 25 tons of copra at ₱95 a ton?

6. At 15 centavos a picul, what will it cost to have 43 piculs of rice hauled to the market?

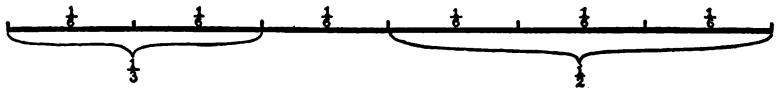
7. Tomas hulled 64 gantas of rice, and was paid $\frac{1}{4}$ of the rice he hulled. How many gantas did he get? How many gantas went to the owner?

8. A merchant sold 27 pieces of linen, each 24 yards long. How many yards did he sell?

9. It is 628 miles from Manila to Hongkong. How far does a boat travel in going from Manila to Hongkong and returning?

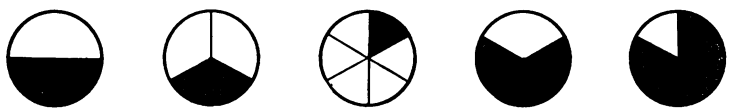
10. A merchant in Jolo sold $3\frac{1}{2}$ tons of shells at $250 a ton. How much did he get for them?

HALVES, THIRDS, AND SIXTHS



70. Oral.

1. How many sixths are there in the line?
2. How many sixths are there in $\frac{1}{2}$ of the line?
3. How many sixths are there in $\frac{1}{3}$ of the line?
4. Which is longer, $\frac{1}{2}$ or $\frac{1}{3}$ of the line?
5. What part of each circle is shaded?



6. Which is larger, $\frac{1}{2}$ or $\frac{2}{3}$ of a circle?
7. $\frac{2}{3}$ of a chico equals how many sixths of a chico?
8. How many halves, thirds, and sixths are there in 1? In 2? In 5? In 7? In 10?
9. Into how many equal parts is this orange divided?

10. One of these parts is $\frac{?}{6}$ of the orange.
11. Two of these parts make $\frac{?}{3}$ of the orange.
12. Three of these parts make $\frac{?}{2}$ of the orange.
13. If you take away one third of the orange, how many sixths are left?

71. Written.

1. Maria has $\frac{1}{3}$ of an orange. Paz has $\frac{1}{6}$ of an orange. Both girls have $\frac{?}{6}$ of an orange.

2. $\frac{1}{2}=\frac{?}{6}$. $\frac{1}{3}=\frac{?}{6}$. $\frac{2}{3}=\frac{?}{6}$. $\frac{3}{6}=\frac{?}{2}$.

3. $\frac{1}{3}+\frac{2}{3}=\frac{?}{3}$. $\frac{1}{6}+\frac{1}{6}+\frac{1}{6}=\frac{?}{6}=\frac{?}{2}$.

4. $\frac{2}{3}-\frac{1}{3}=\frac{?}{3}$. $\frac{5}{6}-\frac{3}{6}=\frac{?}{6}=\frac{?}{3}$.

5. Find $\frac{1}{2}$, $\frac{1}{3}$, and $\frac{1}{6}$ of each of the following numbers: 12, 18, 24, 36, 54, 72, 120, 150, 270.

72. Oral.

1. Bring to school a string 1 foot long. Fold it to show $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{3}$, $\frac{1}{6}$.

2. Draw on the blackboard a line 1 meter long. Under this line draw other lines to show:

$\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{8}$ of a meter.

3. $\frac{1}{2}+\frac{1}{3}+\frac{1}{6}=$ how many sixths?

4. $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}=$ how many eighths?

5. How many ones are there in $\frac{9}{3}$? In $\frac{12}{6}$?

6. In $\frac{1}{4}$ of a year there are . . . months.

7. What part of a minute is 10 seconds?

8. What part of each square is shaded?

DIVISORS ENDING IN 0

73. Written.

To divide a number ending in 0 by another number ending in 0, cancel a 0 at the end of each and divide as usual.

$10)\overline{240}$ $\quad$ $20)\overline{320}$ $\quad$ $50)\overline{7500}$ $\quad$ $80)\overline{4000}$

24 $\quad$ 16 $\quad$ 150 $\quad$ 50

1. $730 \div 10 =$
2. $960 \div 20 =$
3. $3{,}440 \div 40 =$
4. $300 \div 50 =$
5. $7{,}840 \div 40 =$
6. $8{,}370 \div 90 =$
7. $3{,}040 \div 80 =$
8. $9{,}600 \div 120 =$
9. $1{,}330 \div 70 =$

$2)\overline{11}$ $\quad 5\frac{1}{2}$ — 11 contains 2, 5 times with 1 remainder. The remainder is written one half. The entire quotient is five and one half.

$3)\overline{23}$ $\quad 7\frac{2}{3}$ — The remainder is 2. The entire quotient is seven and two thirds.

10. $29 \div 2 =$
11. $65 \div 2 =$
12. $83 \div 3 =$
13. $75 \div 4 =$
14. $648 \div 5 =$
15. $318 \div 7 =$
16. $954 \div 5 =$
17. $1{,}844 \div 8 =$
18. $1{,}263 \div 9 =$

74. Oral.

Give quotients:

1. $120 \div 20$
2. $240 \div 30$
3. $360 \div 40$
4. $450 \div 50$
5. $480 \div 60$
6. $630 \div 70$
7. $800 \div 80$
8. $810 \div 90$
9. $720 \div 80$

TRANSPORTATION

75. Written.

1. It is 196 kilometers from Manila to Dagupan. At 4 centavos a kilometer, what will it cost to go by train from Manila to Dagupan?

2. The railroad connecting these two cities was completed in 1882. How long has it been in use?

3. At ₱ 3.22 a ton, what must I pay to send 14 tons of freight to Malolos?

4. The distance from Tarlac to Victoria is 16 kilometers. If I pay ₱ 3.20 to go by carromata from one of these towns to the other, what do I pay per kilometer?

5. Manila is 6,943 miles from San Francisco, and 628 miles from Hongkong. How much greater is the distance to San Francisco than to Hongkong?

LONG DIVISION

76. Written.

Find quotients:

```
  14
12)168
 12
---
  48
  48
  --
```

In long division the quotient is written over the dividend.

12 is contained in 16, 1 time. Multiply the divisor by 1, and subtract the product from 16. Bring down the next figure, 8, of the dividend. 12 is contained in 48, 4 times. Multiply the divisor by 4, and subtract the product from 48. There is no remainder. The quotient is 14.

```
  14        12        35        104
13)182    15)180    21)735    34)3536
 13        15        63        34
---       ---       ---       ---
  52        30       105       136
  52        30       105       136
  --        --       ---       ---
```

A satisfactory understanding of long division comes only from blackboard work before the class, followed by plenty of drill.

The teacher should explain carefully several problems on the blackboard. See that the pupil observes the correct form in writing problems, and places each quotient figure over the proper figure of the dividend.

The teacher should call attention to the fact that it is *usually* necessary to notice only the first two figures of the dividend and the first figure of the divisor to determine the quotient figure. Also that it is *usually* necessary to bring down only one new figure of the dividend with each subtraction.

1. $264 \div 12$	4. $781 \div 11$	7. $1{,}224 \div 12$
2. $561 \div 11$	5. $252 \div 21$	8. $1{,}320 \div 12$
3. $264 \div 11$	6. $651 \div 21$	9. $3{,}570 \div 34$

10. $231 \div 21$
11. $273 \div 21$
12. $484 \div 11$
13. $441 \div 21$
14. $2{,}646 \div 21$
15. $2{,}352 \div 21$
16. $4{,}473 \div 21$
17. $2{,}442 \div 22$
18. $961 \div 31$
19. $1{,}488 \div 31$
20. $9{,}641 \div 31$
21. $943 \div 41$
22. $1{,}394 \div 41$
23. $2{,}684 \div 22$
24. $792 \div 22$
25. $7{,}392 \div 32$
26. $9{,}952 \div 32$
27. $1{,}408 \div 32$

77. Oral.

1. Francisco paid 72 centavos for a dozen mangos. What did they cost apiece?

2. How many 11's are there in 121?

3. 15 handkerchiefs were sold for 75 centavos. What was the price of each?

4. How many days, at ₱ $\frac{1}{2}$ a day, will it take for a man to earn ₱ $3\frac{1}{2}$?

5. If 1 hektar of land yields 75 piculs of sugar, how many piculs does $\frac{1}{3}$ of a hektar yield?

6. How many quarters are there in \$ $2\frac{1}{4}$?

7. At ₱ 15 a suit, what must I pay for 4 suits of clothing?

78. Written.

1. $882 \div 42 =$
2. $5{,}586 \div 42 =$
3. $1{,}196 \div 52 =$
4. $1{,}404 \div 52 =$
5. $759 \div 23 =$
6. $1{,}196 \div 23 =$
7. $462 \div 33 =$
8. $3{,}366 \div 33 =$
9. $8{,}643 \div 43 =$
10. $5{,}203 \div 43 =$
11. $3{,}729 \div 33 =$
12. $5{,}661 \div 51 =$
13. $1{,}220 \div 61 =$
14. $1{,}420 \div 71 =$
15. $2{,}880 \div 24 =$
16. $3{,}774 \div 34 =$
17. $4{,}928 \div 44 =$
18. $6{,}804 \div 54 =$
19. $1{,}188 \div 54 =$
20. $2{,}112 \div 64 =$

21. There are 31 days in July. If Mr. Santos paid 15 centavos each day for fish, what did they cost him for the month of July?

22. At 19 centavos a meter, how many meters of ribbon can be bought for ₱ 2.47?

23. Fifteen carabaos were sold for ₱ 1,230. What was the price of each?

24. A merchant paid ₱ 15.60 for two dozen boys' hats. What did they cost apiece?

25. At 45 centavos each, what will 4 dozen arithmetics cost?

79. Oral.

Give differences:

1. 80 − 40
2. 60 − 20
3. 100 − 10
4. 100 − 30
5. 200 − 100
6. 200 − 50
7. 100 − 70
8. 300 − 250
9. 90 − 80
10. 700 − 200
11. 250 − 150
12. 900 − 500

Give sums:

1. 20 + 80
2. 30 + 90
3. 70 + 40
4. 60 + 60
5. 50 + 100
6. 40 + 80
7. 120 + 120
8. 500 + 500
9. 300 + 400
10. 700 + 200
11. 150 + 150
12. 600 + 600

80. Written.

Find quotients:

1. 1,530 ÷ 34
2. 4,212 ÷ 52
3. 8,910 ÷ 45
4. 7,534 ÷ 37
5. 4,173 ÷ 13
6. 2,775 ÷ 25
7. 4,830 ÷ 15
8. 756 ÷ 36
9. 1,376 ÷ 43
10. 1,350 ÷ 54
11. 4,725 ÷ 63
12. 1,332 ÷ 74
13. 1,407 ÷ 67
14. 767 ÷ 59
15. 2,144 ÷ 16
16. 3,906 ÷ 18
17. 1,218 ÷ 29
18. 2,774 ÷ 19

81. Oral.

Give quotients:

1. $88 \div 4$
2. $44 \div 22$
3. $50 \div 25$
4. $36 \div 2$
5. $33 \div 11$
6. $48 \div 24$
7. $60 \div 20$
8. $42 \div 2$
9. $84 \div 12$
10. $72 \div 36$
11. $90 \div 30$
12. $80 \div 20$
13. $84 \div 2$
14. $39 \div 13$
15. $46 \div 23$

82. Written.

Find quotients:

$$\begin{array}{r} 113\frac{1}{21} \\ 21\overline{)2374} \\ 21 \\ \hline 27 \\ 21 \\ \hline 64 \\ 63 \\ \hline 1 \end{array} \qquad \begin{array}{r} 205\frac{11}{36} \\ 36\overline{)7391} \\ 72 \\ \hline 191 \\ 180 \\ \hline 11 \end{array} \qquad \begin{array}{r} 200\frac{1}{15} \\ 15\overline{)3001} \\ 30 \\ \hline 01 \end{array}$$

1. $7{,}378 \div 31$
2. $7{,}392 \div 32$
3. $4{,}625 \div 46$
4. $8{,}972 \div 75$
5. $6{,}085 \div 57$
6. $3{,}927 \div 45$
7. $5{,}124 \div 66$
8. $6{,}055 \div 93$
9. $9{,}025 \div 86$
10. $6{,}048 \div 28$
11. $9{,}321 \div 92$
12. $9{,}108 \div 79$

REVIEW

83. Written.

1. There are 100 ars in 1 hektar. How many ars are there in 125 hektars?

2. How many inches are there in 78 feet?

3. A shopkeeper buys 16 pairs of chinelas at 30 centavos a pair, and sells them at 40 centavos a pair. What is his gain?

4. A man buys a piano for ₱ 480. How long will it take him to pay for it, at the rate of ₱ 12 a month?

5. If 12 tons of coal cost ₱ 120, how many tons can be bought for ₱ 150?

6. Maria can iron 23 pieces of clothing in $\frac{1}{2}$ of a day. How many pieces can she iron in 8 days?

7. Hop Lee bought 6 gantas of oil at 30 centavos a ganta, and 4 fish at 12 centavos each. How much did he pay?

8. I bought 2 dozen oranges for ₱.48, and sold them for ₱.03 each. What did I gain?

9. If each bottle holds 4 chupas, how many bottles can be filled with 7 gantas of oil?

The teacher is expected to supply abstract review examples in multiplication and division.

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